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MID-TERM EVALUATION

April - May, 1986

SENEGAL RURAL HEALTH PROJECT

PHASE II

P R E F A C E

This report is the result of the considerable efforts of an evaluation team assembled by USAID/Dakar in Senegal and by Management Sciences for Health in the US on behalf of USAID/Dakar to assess mid-point progress of Project 685-0242, Senegal Rural Health, Phase II.

The evaluation team consisted of 10 members representing the Government of Senegal and USAID. The following individuals were involved:

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- Mr. Donovan RUDISILE : Financial Analyst

The evaluation field activities took place between April 28 and May 23, 1986, except that the work of the financial analyst began and ended later than that of the others. During this time, the team supervised an in-depth sample survey of project activities, reviewed project documents, undertook preliminary analysis of survey data, conducted interviews in Dakar and in the field. In addition, each of the members of the team produced one or more reports. Such an extensive effort in such a short time period made considerable demands on the evaluation team. All members deserve to be congratulated for their dedication and long hours of work.

In spite of the long hours, these activities consumed all of the time alloted for the entire evaluation process, including final report preparation. The result was that the team was obliged to disband in late May before data analysis could be completed and without team members having had an opportunity to review and discuss each others' chapters, conclusions or recommendations.

Recognizing that his academic commitments were unlikely to allow him further involvement in the evaluation, Dr. Cushman submitted his own summary and conclusions shortly after leaving, acknowledging that there had been no chance to review (or revise) them with his colleagues, but hoping that they would prove useful. (That document has been among the sources used in preparing the Summary and Recommendations chapter, and is appended in its entirety as Annex I of the report.) Meanwhile, the Senegalese team members took advantage of ready access to the survey data after its analysis to produce revised versions of their chapters late in the summer. With the pieces thus completed, there remained the task of preparing an overall summary and recommendations, and converting disparate documents into a unified report. With Dr. Cushman unavailable to return to Senegal for this purpose, USAID and Management Sciences for Health eventually agreed that Dr. Richard Roberts, an MSH management specialist, would undertake that task in Senegal December 5-11, 1986.

During that time, he drafted a summary and recommendations on the basis of the several documents prepared by the team. In Kaolack, December 9-11, these drafts were reviewed and revised by Dr. Roberts and three of the Senegalese team members. Their collective efforts resulted in a summary and recommendations which were presented to representatives of the involved ministries, the Project and USAID at a briefing in Dakar December 12, and now constitute the Summary and Recommendations chapter of this report.

The other chapters of the report are substantially as they were prepared (or revised) by their individual authors. In the few cases in which two or more documents were combined to create a single chapter, it is indicated in a note at the beginning of the chapter concerned. Unfortunately, the time budgeted permitted very little editing of the translations of reports submitted in French, a fact that will be evident to any reader and which is regretted by all concerned. Bearing in mind that the principal use of the report should be to guide project management (in the Ministry of Health, the Project office and at USAID) Dr. Roberts has annotated the translations to draw attention to significant matters that seem to call for clarification or investigation, to identify issues on which survey data should shed light.

The evaluation team was very impressed by the project, which has effectively doubled in size since the beginning of Phase II. The Fatick and Kaffrine Departments are now well served by village health huts. Some progress has also been made in the implementation of the technical components; nonetheless, the latter remain the major service challenge for the duration of Phase II. The team also found that the drug supply system is well established, and that possibilities for auto-financing are being explored at all levels. The project is training large numbers of personnel, all the way from the Region to the village levels.

Certainly what struck the team the most is the excitement and dedication of all those involved in making the project a success. There was widespread enthusiasm. Essential services are now available at the village level. In meeting the needs of the people, the project has provided the Region with an essential service. In contributing to building and maintaining the rural health care system, the people of the area have set an example for the nation.

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While Management Sciences for Health made available some of the expertise involved, orchestrated the drafting of the Summary and Recommendations, and assembled the individual documents into the present report, all credit for the contents of the document must go to the individual team members whose considerable efforts made it a reality.

MID-TERM EVALUATION

SENEGAL RURAL HEALTH PROJECT

PHASE II

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SUMMARY

I. EXPANSION OF THE PROJECT AREA

1. After 370 health huts were established in the five years of Phase I of the Project, the installation of 255 in the "circonscriptions medicales" (CMs) of Fatick and Kaffrine was envisaged during the 4 years of Phase II. During the first two years of Phase II, the four-year target has been surpassed. In May, 1986, there were 310 health huts in the target zone, presumably including 50-60 remaining from a Dutch project. In the six Departments involved in the Project, the evaluation team visited 43 health huts, of which 75% had cement floor and zinc roof and shutters, the others being built of "banco", with straw roof and no shutters.

2. The expansion of the Project advanced at an impressive pace during these two years. It was not possible to identify all of the reasons permitting the pace achieved, but one is thought to have been interest, and even demand for health huts stimulated by awareness of their success in nearby villages participating in Phase I. Another important factor was certainly the active involvement of the local authorities of different levels from the start, and their interest in the Project.

3. The Project built eight health posts. These await furnishing, which is to be provided by USAID in the near future.

4. The expansion has progressed well and it objective is achieved; the task now is to ensure system viability.

II. NEW TECHNICAL COMPONENTS

5. In 10 base villages (those with health huts) and 64 satellite villages (without health huts) in the four Departments involved in Phase I, the Project was to introduce during Phase II the following technical components:

- the fight against malaria,
- oral rehydration therapy,
- an expanded vaccination program, and
- nutrition and growth monitoring.

The target population was infants up to age 5 years and women in the reproductive ages (15-45 years). The team's conclusions are based on visits and interviews in the field and a sample survey of mothers in the test zone (the participating villages).

6. The Fight Against Malaria. Objective: 50% of the target population using chloroquine prophylaxis. The survey[1] suggests that the 50% target was exceeded, but it also raises doubts on this point. On the one hand, according to their replies to the survey, 89% of the mothers regularly take preventive doses of chloroquine when pregnant or nursing, and 86% regularly give it to their children. On the other hand, less than half the women surveyed knew the correct dosage for any of the target group; moreover, 50% of the mothers said they had fever (which could have been malaria) during the last rainy season, and 67% said their children had it.

7. Possible explanations of those anomalies: the mothers having had fever could be among those not pregnant or nursing at the time, and thus not on the prophylaxis; errors in the survey process, anywhere from replies given through input to the computer; incorrect dosages; a malaria variety resistant to chloroquine. Certain of these possibilities can be eliminated, or confirmed, by further review of the questionnaires and data.

8. Villagers should obtain chloroquine from the "animatrices" in the satellite villages and the community health worker (CHW) at the health huts in the base villages. According to the survey, 42% of the mothers said they are supplied by the animatrice, 51% by the CHW and others (7%) by one or the other depending on availability of stock. These data suggest that the mothers are being supplied in their own villages, as planned.

9. The reference to 'depending on availability of stock" above draws attention to the fact that there are stock-outs. It appears that about 70% of the mothers who said their supplier is determined by availability of stock are in satellite villages. The survey of CHWs confirmed that there are stock-outs of chloroquine.

10. Less than half the mothers surveyed could identify any one of four common methods of fighting against mosquitoes.

11. Oral Rehydration Therapy. Objective: 50% of the mothers knowing how to prepare and use the home-made ORS. According to the survey results, this objective was attained, and even surpassed.

12. The solution in question can be prepared at home with locally available products (sugar, salt, water). With the support of Regional personnel trained in the technique, 16 CHWs and 84 animatrices taught mothers how to prepare and use the ORS.

13. According to the survey, 84% of the mothers in the test zone know of the ORT program, and 55% used it the last time their children had diarrhea.

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[1] Unless otherwise stated, 'survey' refers to the sample surveys carried out as part of the mid-term evaluation in April-May 1986. Copies of the questionnaires used can be found in Annex III.

14. Moreover, the evaluation team had the impression that ORT is known and used in all of the project area, even though it has been promoted only in the test zone (the survey of mothers covered only the test zone; the CHW survey in the expansion zone included a question on the use of ORT, but apparently it was not tabulated).

15. Expanded Vaccination Program. Objective: 50% of the target population vaccinated against the seven diseases targeted in the Regional program. The survey did not give all the detail needed for a thorough analysis, but this effort has not really begun.

16. The material is in place at the health posts. Technical and supervisory personnel have been trained, but training has not reached the village personnel. In the context of the national EPI the same inoculations are provided by the "Service des Grandes Endémies" and certain health post heads (who are expected to operate on a mobile basis in the context of the Project), as well as by mid-wives of the Mother-Child Health program.

17. According to the survey, 19% of the mothers said they had been vaccinated against tetanus during the past 12 months (57% of these were able to show their vaccination cards); 73% said their children had been vaccinated during the same period (the mothers were able to produce cards for in 53% of these cases).

18. The situation described by these data is not the result of any special effort on the part of the Project; this being the case, they can be used as baseline data for future evaluation.

19. Nutrition and Growth Monitoring. The strategy described in the project document for Phase II has been neither updated, nor implemented.

III. TRAINING

20. Objective: reinforcement of the technical and supervisory skills of the management (encadrement) personnel, and development of depot managers, agents and other community agents, as well as district and village committees capable of ensuring the planned services. To attain these objectives, the training of a certain number of officials as trainers was foreseen, as was the creation of a training center.

21. Basic training was to be given to personnel in the expansion zone, refresher training to CHWs and members of health committees in the overall project zone, training of trainers to the technical and supervisory staff of the region, and long-term training to certain key officials of the Project and the Ministry.

22. The Training Center was inaugurated in January 1985 and has been in service since that time. Dormitories added and equipped by the Project during Phase II should soon be formally received by the GOS.

23. The Center is staffed, with the exception of an Administrative Director and a Director of Studies, both of whom left for long-term training in the US in May, 1986. Having these positions covered by officials with other major responsibilities, as at present, will not work well for very long.

24. At the time of the evaluation some of the Center's personnel (5 persons) were paid by the Project, and the Center did not yet have a legal statute.

25. The Center was used more than 50% of the working days between its entry in service in early 1985 and April, 1986.

26. The Center was used by the Ministry of Public Health for two non-project seminars during the period of review. However, it is not really open to others; this is said to be due to the lack of a legal statute and of formal internal administrative procedures.

27. Thirteen officials from the Ministry, the Region and the District levels have participated in short-term training abroad under the Project.

28. Only four of the ten people expected to pursue long-term (2-4 years) training abroad had begun their studies as of April, 1986. The delay is attributed to delays in the signing of the technical assistance contract with Harvard University (HIID).

29. In the test zone, the survey indicates that virtually all (93%) of the CHWs and "matrones" questioned had been trained in the use of ORT, 79% in methods to use in the fight against malaria, and about half in nutrition and growth monitoring. Project files suggest that the same numbers have been trained in ORT as in anti-malaria work. There has been no immunization training.

30. In each case village (where there is a health hut) there is a health committee; 1,792 members of such committees in the expansion zone were trained in 109 sessions.

31. The Project trained 396 members of 33 management committees in the expansion zone, as well as 33 pharmaceutical depot managers.

32. Refresher training (recyclage) is an integral part of the program. Staff trained in ORT and anti-malarial techniques had refresher training a year after their basic training. According to the survey replies of health post heads in the Phase I zone of the Project, they gave refresher training to all of the CHWs and matrones under their jurisdiction in 1984 and 1985, but 43% of the CHWs and matrones in that zone (the test zone) said in their replies to survey questions that they had not had any refresher training, and in general the pace of such training seems to have slowed in 1986. In the case of the expansion zone, 82% of the CHWs (and matrones) reported having had refresher training

at least once. According to Project plans, such training should cover a variety of subjects and take place twice a year for the CHWs and annually for health committee members. In practice, "refresher training" seems to be fairly informal, does not reach all village staff, and has totally the health committees.

33. Unfortunately, officials of the Rural Expansion Centers and others outside the Ministries of Public Health and Social Development are excluded from Project training.

IV. SUPERVISION

34. Objective: the installation of a supervision system reaching from the central services of the Ministry to the villages, one that will help and facilitate the transfer of Project management to the Ministry.

35. The supervisory system calls for each level to supervise the one below it, from the national level, down through the Regional, Departmental and CM levels to the head of the HP who supervises the CHWs and the matrones in their villages. However, in practice, the Regional supervisors sometimes interact directly at the HP and village levels (which can diminish the authority of those who should be supervising those levels).

37. From the evaluation interviews, one has the impression that in the expansion zone supervision has certainly played an important role in the success of the Project thus far. However 19% of the CHWs responding to the survey said they had never been supervised, and the discovery of a certain number of problems in the pharmaceutical supply system (poor record-keeping, stock-outs, unresolved problems caused by out-dated stocks) suggests that supervision has not accomplished all that is expected of it. Moreover, in the test zone, where the health system has been involved with the Project for over two years, one had a sense of a laxness in supervision; this was reflected in a dispersion of the committee members, disregard of the role of the committee and disinterest on the part of CHWs.

38. Supervision reports move up through channels to the Project Unit without being exploited, although for each level their exploitation could tell supervisors much about what is going on. This is particularly important the Regional Supervisors, who are "farthest" from the villages and thus depends the most on information transmitted by others.

39. The filing system of the Project Unit did not permit verification of either the regularity of receipt of reports or of follow-up being given to issues raised on earlier field visits.

40. In the case of Patick, lessons seem to have been learned from the past, and the system works within the hierarchy. However, there is a general problem in the sense that the supervisors have a tendency to communicate problems to their superiors rather than solving them directly in

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the field. The Regional and Departmental supervisors are under the effective control of the Chief Physicians.

41. The supervision system was not planned to contribute to the planning of basic or refresher training, but considering that supervisors are also trainers in this context, and that experience is exchanged during monthly coordination meetings, one would hope that training reflects to a reasonable extent the realities found in the field.

42. Supervisory checklists/forms have been proposed to ensure that the important points are always covered during supervisory visits, but they are not used. The supervisors also apparently do not use prior trip reports for guidance on succeeding trips.

V. INFORMATION SYSTEM

43. During Phase II, the aim was to (a) improve the MIS in place since Phase I, especially in terms of increasing efficiency, introducing the use of the computer, and applied research, (b) put in place an epidemiological surveillance system with which to follow and evaluate Project activities.

44. By the end of the period 1984-1986, the Project was to (a) regularly analyze and send essential information in a timely fashion to Department and Region authorities, and (b) have in place a standard system of reports on the experiments under way in the 16 test villages. These goals are by no means attained.

45. Special attention was given the Health/Management Information System when Phase II was planned, because the experience of Phase I had demonstrated the need for it.

46. The present system requires the CHW to keep four registers and drug purchase orders. These documents incorporate a long list of data: demographic, epidemiologic, financial, service activity, and management (e.g. of drugs). It was not possible to evaluate the quality of the data, or of the reports, but the subjective impression of at least one member of the evaluation team was that they leave much to be desired.

47. The HP head must prepare five monthly reports (six in the test zone), and in some cases more. In addition, it is they who must transcribe data from the health hut registers. Many of the data in those registers stays right there, but it reportedly gets some use by HP heads in their role as supervisors of the CHWs. Considering the substantial effort required on the part of the CHWs to record all the data they are asked to keep, most of which go unused, one wonders if it is all necessary.

48. With the number of reports the HP heads must prepare, and given the fact that they are not always gifted or skilled in calculations, the MIS requires a considerable effort on their part. One wonders if the

Project would not be better served by a reduction in these demands in favor of a greater effort on supervision, or on delivery of medical services.

49. At the Project Unit, the Coordinator reviews activity reports from the supervisors and HP heads, works with them to find solutions to problems reflected in the reports and transmits certain data to the Region to justify mobylette fuel allocations. However, other reports containing raw data are simply filed when they arrive at the Project Unit (except that data relating to the finances of health huts are reviewed).

50. What information is needed? There is uncertainty on this point. Basically, it is a function of needs and possibilities. Needs are derived from the objectives of technical and administrative activities of the Project.

51. The data communicated up through channels are found to be of little management utility. This is not surprising, considering that they are primarily raw data, sometimes aggregated. The near total absence of data processing is a major weakness.

52. A series of indicators focusing on operational and medical objectives of the project was identified in the planning of Phase II. To convert data to indicators, the data must be processed--some calculations must be done. At each level of the system, the results of some such processing are needed. But neither at the hut nor at the HP does anyone really have either the training or the time to do it.

53. For this second phase of the project, it was understood that a statistician would be assigned to the Kaolack Medical Region. Thus far this has not been done.

54. The Project has a microcomputer which would facilitate the production of the proposed indicators (and others as well). The computer is under-utilized, although someone with an aptitude for numbers could learn to use it for this purpose in little time.

55. The survey and interviews in the villages and at the HPs led to the conclusion that the reasons for the considerable work of recording and communicating data are not understood. This is partially a matter of training, but still more a result of the lack of feedback in the system. Some cases of feedback were cited, but it was compliments or criticism on the way forms were filled out rather than relating to the technical work reflected in the data; it is not clear how common, or rare, that is. The evaluation team was assured that monthly activity reports are discussed at monthly meetings, and that action is taken on the basis of the information they contain, which constitutes a form of feedback. Still, at the Department and HP levels, the authorities lament the fate reserved for the data collected and sent up in other reports.

56. The Ministry of Public Health has one health/management information system and the Project has another. One Regional official complained that data his service needs remain filed at the Project. The extent of duplication in the systems was not defined, but they will certainly have to be integrated after the end of the Project: the earlier that integration is planned the easier it will be.

VI. PHARMACEUTICAL SUPPLY SYSTEM

57. The objective of the present phase is to establish the system in the expansion zone, and to reinforce the distribution and resupply system at all levels in the six Project Departments.

58. The pharmaceutical supply system of the Project is parallel and complementary to that of the State, but the former is conceived above all to get drugs to health huts built by the people at the village level. A Regional depot in the future Regional Pharmacy supplies Departmental depots in health centers; these, in turn, supply community depots at HPs, from which the health huts obtain what they need. USAID provided the initial stock and the villagers are to resupply themselves through the system, paying with income generated by the sale of drugs and health hut services.

59. In the expansion zone, three Departmental depots and 31 community depots (70% of the 44 planned) have been opened.

60. Each health hut is to be considered an autonomous, self-managed, self-financed unit, and to be able to maintain the revolving fund with which it was initially established. A check of 43 huts found 21% with a positive balance, 23% negative and 56% whose records were in such a state that it was impossible to draw conclusions on the financial viability of the hut.

61. Purchase orders exist at all levels of the system, as do at least two kinds registers (ledgers) or cards/forms to control the level and use of inventory and cash. It is clear that the CHWs have a lot of difficulty with cash and stock accounting; many do little more than file purchase orders.

62. In general, the registers/ledgers and other record forms are poorly kept up and management necessarily suffers.

63. Responding the survey, 92% of the CHWs estimated that the products in the health huts meet the basic needs of the villages.

64. The survey found that, of the villages reporting, two-thirds had experienced stock-outs in the past six months (63% in the test zone, 68% in the expansion zone); of those reporting stock-outs, roughly half had stock-outs of nivaquine and/or aspirin, and smaller percentages of other drugs.

65. The evaluation team found that at the health center and post levels, officials "borrow" drugs from the stock held for the health huts and do not replace the "borrowed" products. If this becomes very common, the viability of the system will be in jeopardy.

66. Some AF heads take the place of the depot management committee. It is not clear to what extent this is under committee control.

67. At different levels of the system, products not on the official list authorized for the health huts were found in the inventory. This could have significant health risks.

68. Supervision depends on the Regional and Departmental Chief Medical Officers, seconded by supervisors. It seems to be limited to collecting data and taking them to the Project Unit.

69. There does not appear to be a policy to deal with outdated pharmaceuticals. This is likely to create problems for the financial viability of the huts and/or the depots, or--if the products are used--for the health of the villagers.

70. The cleanliness of some of the huts and the hygienic conditions in which they operate leave much to be desired. Supervision is needed.

71. Conclusion: the system seems to be well structured, but there are operational problems that need attention.

VII. FINANCING RECURRENT COSTS

A. OVERVIEW

72. The Senegalese economy has been through difficult times in the past decade. This is reflected in the Ministry of Public Health budget. As a percentage of the total government budget, it has declined from 8.6% in 1972-73 to 5.4% in 1984-85; the WHO recommends 9%. The present project is almost entirely financed by USAID, but this funding will end in 1988. It is time, now, to figure out how the Project's recurrent costs will be absorbed by the GOS.

73. Among the recurrent costs: fuel and maintenance of vehicles and mobylettes, drugs, water, electricity, telephone, building up-keep, office expenses, personnel (including per diem during training and supervisory field travel).

74. Absorption of Project recurrent costs by the Medical Region implies an increase in its budget. The alternative is to identify other sources of financing to lighten the burden on the State.

75. The idea of community participation in the financing of health services has been raised. The consensus seems to be that through one device or another, the people can probably finance the resupply of the drug

stocks at the health huts and, if they are so inclined, provide some material incentive to the CHWs. The Rural Community budget might eventually provide funds to replace the mobylettes.

76. Project design envisaged having mobylette maintenance and repair become the responsibility of the health committees, but the evaluation committee did not find any that had financed such costs.

77. In theory, each Rural Community should establish a proces-verbal formally accepting a mobylette provided by the Project; this, it is said, would give them responsibility for replacing them. In the expansion zone, 24% (7 of 72) of the Rural Communities have done this. To permit them to use their budgets for this, a revision of budget rules and/or terminology has been suggested.

78. In general, the Regional administrative authorities favor having the Rural Communities or the people take over Project recurrent costs, but acknowledge that the participation of the State is not excluded.

79. For example, it is felt that the State should provide the necessary mobylette and vehicle fuel when USAID ceases to do so. Studies show that it should be possible with the allocations of budget year 1982-83 (which have since been cut).

80. Another case is the cost of running the Training Center, most which is financed by USAID. The GOS should begin considering how the Center will be financed after the withdrawal of USAID support.

B. FINANCIAL ANALYSIS

81. An analysis of the local expenses of CFA 131 million of the Project in two years finds that by far the most important categories are per diem during training (33% of the total) and running the Project Unit (49%). The closing of the Project Unit with the ending of USAID involvement will thus substantially reduce costs to be absorbed. Nevertheless, the project costs far too much to be taken over in its present form by the GOS.

82. Analysis of the operating costs of the car park shows that the main items are fuel (58%) and repairs (33%). The detailed analysis raises a number of issues for further study. For example, maintenance and operating costs per kilometer are 80% higher for Project 404 diesel cars than for its 404 gasoline cars the same age.

83. The cost of maintaining, operating and replacing the car park is estimated under several hypotheses (see the text and exhibits). Among the details derived from the analysis, one finds that the fuel cost for project activities in 1989 will be equivalent to 65% of the Fatick and Kaolack fuel budget in 1985.

84. It is estimated that more than half the expenditure in fuel is accounted by activities other than supervision. This was concluded from an analysis of distances to be covered, fuel consumption rates and other pertinent data related to supervision activities.

85. The annual operating cost (fuel, maintenance, repairs) of the mobylettes used for supervision of the health huts is estimated at CFA 8,000 per village, or CFA 25 per villager.

86. The cost of replacing the mobylettes every three years is estimated at CFA 40,000 per village, or CFA 39 per person per year. Only 17 Rural Communities have committed themselves to this expense.

87. As noted earlier, per diem given CHWs and matrones during training has represented one-third of Project local expenses during Phase II. Most (85-90%) of this was for initial training. Each of the agents received CFA 15,000 in per diem during this training, a large sum in the rural world. Is it excessive, and what would be the effect on morale and motivation if it were reduced? Even after the withdrawal of USAID, replacements for agents who leave for one reason or another will have to be trained and refresher training should be continued. On assumptions set forth in the chapter, at current per diem rates this could cost CFA 8.3 million per year.

88. The Training Center has been operational for too short a time for experience to provide a good basis for estimates of running costs, particularly since the opening of its dormitory in the near future will influence those costs. Careful continuing control of expenditures at the Center becomes important to permit planning for its financing after USAID support terminates.

89. In the health huts, income seems to be adequate to finance the maintenance of inventory levels as envisaged, but the picture is not all that clear, and will not be until there is better record-keeping. A potential problem: it seems that because of HP stock-outs due to irregular deliveries through the Ministry system (from the PNA), HP heads are meeting their own needs by dipping into inventory held for the Community Depots; the "borrowed" stock is not always replaced, or paid for. This decapitalizes the huts and depots involved.

RECOMMENDATIONS

GENERAL

1. If the recommendations which follow are to be acted upon, consider the possibility of extending the life of the Project by one to two years to permit it to achieve its objectives. However, the integration of Project activities and management with those of the MSP should proceed as rapidly as possible and the role of the Project Unit during any extension period should be much less than it is now.

1. Decentralize Project management more, recognizing that the scope of the Project has become much greater during the second phase. This could be done in the context of integrating project activities into the MSP by the transfer of some project responsibilities to the CM medical officer.

2. Find a way to keep administrative and local authorities better informed of Project activities; for example, through the HP head at regular meetings of the Local Development Committee (CLD).

3. Speed up the furnishing of the remaining HPs to make them operational.

4. See to the upkeep of the huts, and encourage the improvement of their floors to meet at least minimal hygiene standards. For the future, establish and enforce minimum material and construction standards for "acceptance" of huts.

5. Speed up the building of the Medical Region facility at Fatick.

6. Encourage the involvement of the rural advisors on the health committees; they can promote the taking of responsibility for health matters in their regions, and more effective follow-up to Project execution.

7. Take necessary action to ensure that the CHWs are functionally literate, to permit better record-keeping in the huts.

TECHNICAL COMPONENTS

8. Malaria - investigate the suggestion by the evaluation survey that there may be a high rate of malaria in a population saying that it practices regular prophylaxis.

9. Malaria - extend the anti-malarial campaign throughout the project area without further delay, but make a special effort to ensure a constant supply of chloroquine accessible to the populations involved.

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10. ORT - reconsider the content of the training and education efforts (including that intended for medical personnel) to better cope with the problems cited at the beginning of the "Observations" section of Chapter II, such as mothers' expectation that ORT stops diarrhea.

11. ORT - extend the ORT effort to the full Project area without further delay.

12. EPI - accelerate the launching of the program in the Project context.

13. Nutrition - with SSHAS, elaborate a Regional strategy and launch a pilot project to implement it, taking advantage of the village infrastructure in place.

TRAINING

14. Provide training for agents of the CER and other development staff working in the rural areas for specific Project needs.

15. Put more emphasis on technical training at the HP and village levels to increase the quality of the health services provided there.

16. Extend refresher training to health committees, especially as concerns the management of pharmaceutical products.

17. Ensure that refresher training is given regularly throughout the six Departments involved in the Project.

18. Speed up implementation of long-term overseas training.

19. Without further delay, name an administrative director and a director of studies for the Training Center to replace those who have left for long-term training, and ensure the installation of replacements for others who leave for training <u>before</u> they leave.

20. Establish a legal statute for the Training Center before fiscal year 1987/88. In so doing, consider the possibility of giving the Center the financial autonomy it would need to become self-financing. It has much more capacity than will be needed for the Project alone, and its infrastructure and services could be made available to other agencies and administrations for a charge that would help finance operations.

21. Ensure that information contained in supervision reports is used in planning training, especially refresher training.

22. In Project radio transmissions, make use of people directly involved in Project activities, e.g. HP heads, CHWs, even villagers.

SUPERVISION

23. Undertake a field study and analyze supervisory reports of the past 12-18 months to confirm or disprove the impression of increasing relaxation of supervision, particularly in the Phase I Departments. If the impression is confirmed, the reasons should be identified, corrective action taken, and a means devised to draw attention more rapidly to any tendency to relax in the future.

24. Effectively make of supervision a process of control and support so that errors found in the field are corrected on the spot.

25. Ensure that each supervision visit follows up on problems identified on previous visits.

26. Check up on the regularity of supervision at all levels, in particular the national level.

27. Develop job descriptions for supervisors at each level in an effort to ensure that each respects the responsibilities of the other.

28. Include as a supervision responsibility identification of knowledge or technical skills that need strengthening and appear to call for training efforts, and establish a way of getting this information to those responsible for developing and delivering training programs.

INFORMATION SYSTEM

29. Make a serious and urgent effort to simplify and rationalize the system. One change to consider would be the elimination of record-keeping in the satellite villages; other desirable changes will be discovered if the following recommendations are implemented.

30. Review, and eventually revise, the existing list of indicators; then put them to use.

31. Review and eventually revise the forms, registers, ledgers and reports now in use and eliminate any that can be replaced. For this purpose, consult the 1983 report of Patrick Kelly in Annex IV.

32. Organize a seminar-workshop involving all interested parties to reconsider the following aspects of the information system: content, forms, communications, processing, analysis and use.

33. Establish a Regional data exploitation and analysis capacity, using the Project microcomputer and taking advantage of DRPF experience.

34. Train the HP heads and supervisors in calculation and analysis, involving the competence of the DRPF.

35. Review and tighten the supervision of data collection and the reporting process from the base to the Ministry.

36. Improve (strengthen) coordination between the Project and the services of the MSP at the Regional level, particularly as concerns the sharing of information.

37. Initiate a study to identify the most effective way to integrate the Project information system with that of the Ministry to ensure an uninterrupted flow of information when the Project ends.

PHARMACEUTICAL SUPPLY

38. Review and put into practice the "Recommendations on the Pharmaceutical System and the Distribution of Medicines" by James E. Herrington, November 29, 1983.

39. Look into the possibility of simplifying the records required and providing additional training to CHWs in drug logistics management.

40. Reinforce and reorient the supervision of the community depots and other parts of the system to ensure that proper procedures are being followed and that the steps needed to avoid stock-outs are taken.

41. Take care that there is an uninterrupted stock of essential pharmaceuticals.

42. Bring under control the practice of health center and HP officials dipping into the inventory reserved for health huts.

43. Eliminate the use at the huts of products not on their approved list.

44. Improve the sanitary conditions and cleanliness of the huts and community depots.

45. Take care that the demands of the Regional Hospital and the health centers do not result in stock-outs at the expense of the huts.

46. Make the Regional Pharmacy operational.

47. As soon as possible, begin the harmonization of the Project system with the MSP system so as to avoid an interruption of supply at the end of the Project.

48. Even after the end of the Project, maintain the system of community depots to ensure that the villagers can continue to buy medicines at low cost.

RECURRENT COSTS[2]

49. Undertake another financial analysis to plan the termination of USAID financing and the taking over of financial responsibility by national sources without damage to the services being provided at the village level. This study should be undertaken as soon as possible.

50. To the extent possible, associate the interested in deliberations and decisions relative to the taking over of expenses of the Project; their participation and information will be essential to any self-financing efforts.

51. Arrange an audit of the Project accounts and a study of the precise nature of all local account expenditures. On the basis of this study, develop a much more detailed chart of accounts than presently exists, plan expenditures on a monthly basis and exercise tight control over monthly and cumulative expenses. Management should be informed whenever expenditures begin to exceed budget limits.

52. Computerize Project accounting, using the Project micro-computer. There are popular, low cost computer bookkeeping programs readily available, such as DAC-Easy and Ready-to-Run. Those who do an eventual audit (see No. 51 above) can advise this matter.

53. Conduct a review of all vehicle usage to see if there are not uses that can be reduced, or simply eliminated.

54. Carefully check the consumption of the 404 diesels. If it is as high as the data cited here indicate, the vehicles should be retired from service as soon as possible, unless a way can be found to reduce their fuel consumption/kilometer to a reasonable level.

55. Establish a written policy on vehicle maintenance and make sure it is respected. Accompany it with training in maintenance for all Project drivers.

56. Study closely the matter of training support costs (particularly per diem and similar costs) with a view to their absorbtion by the GOS.

57. In purchasing mobylettes, make every effort to get products for which the cost of spare parts is not high. Parts for the mobylettes from UNICEF cost three times those for the mobylettes USAID provided.

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[2] Several recommendations relating the recurrent costs have been combined and/or abridged here. They are reproduced in full in Annex VIII.

58. Revise the budget definitions for the Rural Communities, particularly in the "Health" chapter, so that the initial 8% allocation is no longer limited to buying medicines but can be used as a subsidy to the health hut and renewed each year, permitting the use of the funds for changing health priorities. Make the changes needed to permit the communities to use budget funds for the mobylette maintenance and replacement.

59. Reorganize Regional budgets to allow their use to finance the fuel needed for supervisory activities.

60. Seek out micro-projects in the context of community development that could help finance the health huts. The CER should be able to help.

EVALUATION

61. In future evaluations, put the emphasis on the extent to which objectives are being attained, the validity of the original objectives in light of experience and any refocussing, or "getting back on track" that appears to be called for, rather than on data collection as was emphasized in the terms of reference "criteria" provided for the present evaluation.

62. Avoid including formal surveys as integral parts of evaluations, and above all avoid data collection on the scale attempted in this case. In an evaluation requiring data that can only be obtained by an ad hoc survey (i.e. are not provided by an existing information system), complete the data collection, inputting and at least the generation of basic tabulations before undertaking the evaluation itself. This does not exclude involving in survey conception specialists expected to be part of the evaluation team; it does mean separating the two.

63. In any future surveys of this type, include control populations, particularly if baseline data for the area are not readily available for comparison. In the present case, a control population in the Phase I zone but outside the "test zone" and another entirely outside the Project area, would have made the results much more useful to Project management and to Ministry of Public Health planners.

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I. EXPANSION OF THE PROJECT AREA

INTRODUCTION

The Senegal Rural Health Project has expanded into the Fatick and Kaffrine Departments since April 1984. However, the effective expansion of any project must meet the criteria of all the parties involved, and make use of the experience gained in the initial phase of the Project. In this case, the Project does not appear to have identified the suitable conditions for implementation of phase II, which involved an expansion into Fatick and Kaffrine Departments. What happened instead was a rapid implementation of planned activities without any appropriate readjustments or drawing from the experience gained during phase I.[1]

The present review of the Project's expansion into these two Departments will focus on the following points:

- Information and sensitization system;
- Infrastructure management system;
- Personnel training;
- Equipment and drug management.

A. INFORMATION AND SENSITIZATION

The expansion of the Rural Health Project into the Fatick and Kaffrine Departments started with community development efforts to inform and sensitize the populations directly involved in the life of the Project.

However, it needs to be stressed that the documentation of this activity was inadequate to provide clear information at the Project Unit. This activity was the work of the coordinating authorities at all levels of the administrative hierarchy and also of the Public Health and Social Development personnel.

1. The Coordinating Authorities

Chaired by the administrative authorities (Governors, Prefets, and Sous-Prefets), meetings of the Local, Departmental and Regional Development Committees (CLDs, DLDs, RLDs) were held in the participating Departments. The meetings were attended by representatives of the Ministry of Public Health, the Project Unit, the Ministry of Social Development personnel, and the local authorities (the village chiefs of the area). Minutes of the meetings document the discussions that took place.

ALL FOOTNOTES HAVE BEEN ADDED DURING EDITING, WITHOUT EVALUATION TEAM REVIEW UNLESS OTHERWISE NOTED.

[1] This view is not shared by all team members, and is to some extent contradicted later in this same chapter.

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On these occasions, a brief history of the Health Project was traced and its importance in terms of the large number of people it reaches was underscored. These meetings were also opportunities to recall the objectives of the primary health care policy, all this culminating in the choice of the sites for the health huts in accordance with the agreed criteria.

It was in this way that sensitization and information activities were carried out at the various levels of the administrative hierarchy, so that the Project would be recognized as a major step towards the attainment of the government's objective of "Health For All by the Year 2000".

Analysis of survey[2] findings indicates that the two Governors of Kaolack and Fatick Regions - the overall Project area -, were informed of the Project's existence. Both had been assigned to other posts within the Region during the first Phase of the Project.

Regarding the Prefets and Sous-Prefets of the districts ("circonscriptions") concerned, according the survey, 77% of them were informed of the Project's existence, 70% were actually involved in its implementation. Most of them (90%) said they were informed of the Project's progress through the reports of its activities during Departmental and Regional Development Committee meetings. Nonetheless, only 22% knew how many huts were in place.

While the authorities may not have all the data at their fingertips, they provided remarkable assistance in sensitizing the population and in supporting the Project through action when appropriate. Their interventions were timely, taking place whenever there was a problem threatening the proper functioning of the Project.

2. The Technical Services

Sensitization activities were also carried out by the MPH personnel, including the district medical officers[3] as supervisors, and the health post (HP) heads installed prior to the Project.

The decentralized personnel of the Ministry of Social Development was also involved in ensuring outreach to the target audiences, and to this end, three Departmental agents were allocated:

- 1 agent for Koungheul and Malem Hoddar area;
- 1 agent for Kaffrine and Nganda;
- 1 agent for Fatick.

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[2] Unless otherwise stated, "survey" refers to the sample surveys carried out as part of the mid-term evaluation in April-May 1990. Copies of the questionnaires used can be found in Annex III.

[3] "medecins chefs de circonscriptions medicale"

Their activities were scheduled in three on-site visits. The first was to sensitize the populations and to confirm the sites of the health huts. The second allowed for the committees to be set up and community health workers (CHW)[4] to be selected. On the third visit, they outlined the objectives of the primary health care policy to the populations, focusing on the importance of taking responsibility for the huts and motivating CHWs.

In this respect, the evaluation team found that the these authorities participated effectively in the execution of the Project at all administrative levels.

6. INFRASTRUCTURE

1. The Starting Situation

In January 1983, a rural health project funded by Holland bequeathed to the Rural Health Project 88 huts located in the Fatick Department. The assessment of the existing infrastructure revealed 77 huts, of which one was still being built, 18 had been destroyed and 57 were in good condition. Of the latter, five had been transformed into HPs by the populations in order to meet their health requirements.

The lack of precision and clarity of the available documentation made it impossible to assess the numbers and condition of the huts in the Diakhao Sine rural community.[5]

2. Phase II, Mid-Term

According to data collected at the Project Unit, 316 huts were installed in the expansion zone: 112 in Fatick and 204 in Kaffrine. Investigations showed that, in two years achievements far exceed the Project's goal of 255 huts.[6]

The Project renovated and equipped eleven HPs in the Department of Kaffrine, built eight other posts and renovated the Maternity. However, the eight new posts built in Kaffrine are not yet functional due to a lack of furnishings. In Fatick, the Project has just begun construction of Regional facilities. The causes of the delays incurred remain to be identified.

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[4] The translation of 'ASC,' for 'Agent de Santé Communautaire.'

[5] These may be the eleven huts that explain the difference between the 88 cited in one sentence and 77 in another, but we have not been able to confirm these otherwise contradictory figures.

[6] It seems likely that the 316 huts found in 1986 include the 52 that were left by the Dutch, were still in good condition and were not being used as Health Posts. While there was no need to stimulate the building of huts in the villages concerned, they were involved in all of the extension and training activity.

An analysis of the results of the survey of 43 huts, suggests that 75% of the huts are in very good shape with cement walls and zinc roof, doors and shutters. Twenty-one percent are in fair shape, with walls made of local building material (banco), thatched roof and no closures.

C. PERSONNEL

1. Basic Training

All of the community health workers (CHW) surveyed, 30 CHWs and 31 traditional midwives, declared they have undergone a basic training of two to four weeks.

This is an area in which the Project has set a record in the expansion process, drawing on the experience gained during Phase I. The reason for this is that the "Circonscription Medicale" (CM) Medical Officer is in charge of the activities, along with his counterpart of the Ministry of Social Development. After two years implementation, more personnel have been trained by the Project than called for in initial plans based on an assumption of 355 committees and 510 community health workers.

It was pointed out to the Evaluation Team that while, for the Department of Fatick, training was facilitated by the fact that the CHWs already trained by the former Dutch project required only a refresher course, and that the traditional midwives available were all on-site. Such was not the case in the Department of Kaffrine, where the selected villages are isolated, and even inaccessible during the hivernage.

Regarding the training for CHWs to be served by the as-yet unopened HPs of in Kibo, Salv, Darou Miname, Medinatou Salam II, Diokou Mbelbouck, Maka Yop, Katiotte and Dianke Souf, it was given at the operational posts in Kounghoul, Kaffrine Nganda (3 times), Dismikha, and Malem Hoddar. Hence, in trying to make up for delays in opening HPs, an additional workload was assigned to the heads of operational posts in the expansion-zone. This is linked to the absence of any action plan, coupled with a delay in the furniture procurement which was scheduled to have taken place during the first three quarters of Project implementation, namely between April and December 1984.

It has been noted that the community health workers of the Kahi hut, considered as a health post, were trained by the staff of the Kaffrine CM, and that supervision of the village huts was ensured by a nurse from the Kaffrine health center. Such a peculiarity can be explained by the fact that geographically, the rural community of Kahi overlaps with the Kaffrine communal perimeter.

In the expansion-zone, the 3,792 members of the 310 health committees were trained in small groups in three-day sessions. In the Fatick CM, 17 committees were trained in addition to that of the health center depot. In Kaffrine, 12 committees, including that of the medical district were trained.

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In roungheul, 4 committees including that of the medical district also benefitted from the training. Seventeen depot managers for Fatick, 12 for Kaffrine and 4 for Koungheul were also trained on these occasions.[7]

2. Refresher Training ("Recyclage")

In the survey, 18% of the Community Health Workers (CHWs) declared they had never had refresher training, 28% said that they had such training once, and 33% reported attending three refresher training sessions. The time these CHWs have been on the job ranges from 3 to 17 months.[8]

Project records indicate 565 refresher sessions for community health workers during Phase II; 30 were for the Fatick Department, 11 for the Department of Kaffrine, the balance for the four Departments in the Project since Phase I.

The specific case of the refresher training in Kaffrine is worthy of note. Given the delay in the training of the CHWs there, a one-week-intensive refresher course was held by the operational HPs.

3. Supervision

Of the CHWs surveyed, 19% declared they had never been supervised, 21% said they had been supervised twice, and 10% reported one supervisory visit.[9] However, according to the survey of supervisory personnel, all CHWs had been supervised at least once.[10] Project officials described this supervision as taking the form of a "control-assistance," and even at times that of a short refresher session, in addition to involving the collection of the various data recorded--review of which has yet to be effectively carried out.

Supervision is carried out by the heads of the operational HPs and CM medical officers and the Department-level social development agents.[11]

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[7] There is additional detail on numbers of training sessions and people trained in Chapter III TRAINING.

[8] Project planning calls for refresher training 3 times per year. Further analysis of the survey data would indicate how many times the CHWs sampled should have been to refresher training, which could then be compared with the number of times they report have had such training.

[9] That accounts for only 10 of the 61 surveyed.

[10] One could tabulate the CHW responses on supervision by village and group them according to the health post on which they depend to see whether the "no visits" replies are concentrated or generalized.

[11] It is our understanding that this role of the Social Development agents is only during the initial period of establishment of the village committee and the health hut.

4. Other Personnel-Related Problems

From the expansion zone, the district medical officer of Kaffrine is now studying for an MSc in epidemiology and the Director of the Training Center for a Master Degree in Education in the US.

The long-term overseas training effort is way behind schedule. It was planned that 51 health workers would be trained in the five years of the second phase, but over two years into Phase II, only four have started their training.

The commitment of the Government of Senegal to place at the disposal of the Project a statistician and a nutritionist has not yet been fulfilled.

While a commendable effort has been made in the field of training generally, training remains at this time a prerogative of the personnel of the Ministries of Public Health and Social Development. To be most effective, it should be extended to the development agents such as the Regional, Departmental assistants and the officials of the rural expansion centers, who have traditionally interacted with the population at the grassroots level.

The survey revealed refresher training as the weak link of the training component. This training could usefully be extended to health committees, and not restricted to the community health workers, as is the current practice.

6. PHARMACEUTICALS AND EQUIPMENT

The Project set up a drug distribution channel with a Regional depot within the future Regional pharmacy. This depot supplies the health centers, which in turn are expected to supply the community depot at HP level. In the expansion zone, 31 community depots of the 44 planned are operational, and the other 13 are reportedly to be set up in near future. The community depot provides drugs to the village health huts.

Depot managers were trained, and a standard list of drugs and equipment drawn up. An initial drug allotment was made by USAID. For the resupply of the huts, the management committee is expected to resupply the huts with the proceeds of drug sales to the villagers.

The system does have some operating problems. According to the information gathered, significant quantities of drugs earmarked for the health huts are "borrowed" by the HPs and centers, and no "reimbursement" on a regular basis is ensured. It was observed that the chief medical officer sometimes takes the place of the depot manager of the health committee. Similarly, poorly kept management records are an indication that depot operation is not satisfactory.

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at the health hut level, the CHWs encounter many difficulties with the record-keeping they are supposed to do; many or most limit themselves to filling their purchase orders. Refresher training focusing on drug management is needed.[12]

In responding to the survey, the CHWs and traditional midwives in two-thirds of the villages responding in the expansion zone reported stock-outs in the past six months.

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Conclusions and recommendations resulting from this review of the Project's expansion into two new Departments have been incorporated in the Summary and Recommendations chapter.

[12] Training may be needed, but limiting the records they are asked to keep and simplifying the forms or registers used should also be considered.

II. NEW TECHNICAL COMPONENTS

INTRODUCTION

The goal of the Rural Health Project in Senegal has always been to introduce simple preventive health measures. In this last phase of the Project, policy is to introduce selected preventive and health promotion activities in eight test health posts (HPs):

Gandiaye and Thiare	(Department of Kaolack)
Ndrame Escale and Missira	(Department of Nioro)
Ngathie and Mbar	(Department of Gossas)
Passy and Toubacouta	(Department of Foundiougne)

The activities selected focus on malaria prevention, diarrheal disease control, the expanded program of immunization and growth monitoring in conjunction with nutritional counseling. The reasons for selection of these technical focal points include the following:

- Malaria remains a serious public health problem. It is endemic in Senegal and is a key factor in the high rate of morbidity and mortality among the under-fives and for a number of miscarriages among pregnant women. A 1982 family health survey in the Project area put the mortality rate caused by malaria among the under-fives was at 3.4%.

- Diarrheal diseases, alone or associated with malnutrition, account for a significant proportion of deaths among young children. When diarrhea leads to acute dehydration, the metabolism becomes considerably weakened and the outcome is often fatal. Diarrheal diseases are the major causes of morbidity and mortality among the 0 to 5 year-age group (75,6% in Senegal and 6,7% in Kaolack and Fatick).[1]

- The infectious diseases targeted by the Extended Program of Immunization (EPI)--measles, tuberculosis, poliomyelitis, whooping-cough, yellow fever, tetanus, and diphteria--are still threatening the lives of children under five and are responsible for a number of irreversible debilitating after-effects (especially in the case of poliomyelitis).

The selected technical components were to be integrated within the health program already set up during phase I. Within the area covered by 8 different HPs (the "test" posts), the technical components were to be introduced at 16 test health huts chosen on the basis of their viability and the

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ALL FOOTNOTES HAVE BEEN ADDED DURING EDITING, WITHOUT EVALUATION TEAM REVIEW UNLESS OTHERWISE NOTED.

[1] It seems unlikely that these two percentages could be so different but we have no way of checking them. An unattached footnote in the original document cites the Phase II Grant Agreement as a source, perhaps UNLESS OTHERWISE NOTED, figures.

duced at 16 test health huts chosen on the basis of their viability and the commitment of the populations served by the huts. These test huts are referred to collectively by the evaluation team as the "test zone."

A. MALARIA PREVENTION

Goal: To "chloroquinize" 50% of the target groups in the test zone.

1. Strategy

Two strategies have been tested. The first is chemoprophylaxis; during the most contagious period for malaria, the "hivernage" (rainy season), under-fives are given a weekly dose of 10mg/kg of chloroquine per week and pregnant and lactating women receive a weekly dose of 6 tablets.

Target group	Dose	Number of tablets
Children		
0 - 11 months	50 mg	tablet
1 - 3 years	100 mg	1 tablet
3 - 5 years	200 mg	2 tablets
Pregnant and lactating women	600 mg	6 tablets

The second strategy, presumptive chemotherapy, used two different protocols. The first called for administration of chloroquine to all patients showing some signs of fever; dosage was 10 mg/kg for 2 days and 5 mg/kg on the third day. The protocol has now been dropped from the program. The second protocol, advocated by the WHO, calls for single-dose therapy, giving 10 mg/kg of chloroquine to all patients having a fever. With this protocol, no cases of malaria should be missed among febrile patients.

2. Activities

Several activities were conducted in order to implement the malaria prevention program. Beforehand, an exhaustive census was undertaken of under-fives and women of child-bearing age (15 to 49 years) in each test village. The census found 3654 under-fives and 4328 women of child-bearing age in the test zone.

In order to test the reliability of the strategy, HP heads were instructed to take blood samples and thick smears from any febrile case for pathological diagnosis to be confirmed by the Service de Lutte Anti Parasitaire(SLAP). These samples were collected between July and November, 1985. However, out of the 8 HPs initially involved, only 4 completed the task assigned to them by the SLAP. These are the HPs at: Gandiaye, Missira, Mbar and Ndrame Escale.

3. Findings of the Survey[2]

a. For the implementation of this program, training seminars were held at various levels. At the Regional level, the participants were the Medical Officers of Grandes Endémies, supervisors of the technical components, Regional PHC Supervisor, Project coordinator, the Training Center's trainers, and 4 members of the Regional team (SMI; EPS; PPNS; PMI; PF officials).

Six Departmental supervisors 8 heads of test posts, 10 community health workers (CHWs) and 84 village "animatrices" were trained.

b. The drug utilized is chloroquine at a dose of 50 mg.

c. The equipment available included microscope slides for the post heads and "boites a images" for the animatrices.

d. Concerning the blood sampling, 84% of the women interviewed reported having provided samples, only 9% said they understood the reasons the sample was taken and just 3% were informed of the results of their blood test. This may help explain the reluctance of the populations to cooperate as indicated by the Thies office of the SLAP in their 1985 report.

e. Of the mothers surveyed, 86% said that they provide chloroquine to their children to protect them against malaria, and 89% say they take it as a malaria preventive themselves, especially during pregnancy.[3]

f. A significant percentage of mothers were not aware of the correct dosage for the different target groups, as shown in the following table.

Target Group	Percentage of Mothers aware of the dose	Percentage of Mothers ignorant of the dose
0 - 11 months	48%	52%
1 - 2 years	48%	52%
3 - 4 years	28%	72%
Pregnant women	38%	62%

[2] Unless otherwise stated, 'survey' refers to the sample surveys carried out as part of the mid-term evaluation in April-May 1986. Copies of the questionnaires used can be found in Annex III.

[3] Two questions on the survey relate to this matter. One asked if chloroquine was taken (a) by the mother, (b) by the children. The other (3 questions later) asked if it was taken regularly by (a) the mother, (b) the children. In paragraph (g.) below, data from the second question are reported. NOTE that the survey of mothers covered a higher percentage of mothers in the base villages than in the satellite villages, probably biasing it somewhat in favor of the former, which have health huts and are thus a little better equipped than the satellite villages which depend on them.

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This may be due to the fact that during training sessions, each mother only retained information that matters to her in relation to her own health test or to her child's age. This may also stem from a confusion of strategies.

g. According to their replies to the survey, 86% of mothers regularly take nivaquine and 83% regularly provide it to their children and yet the survey reveals that 56% of mothers and 67% of children had malaria last "hivernage". This could be due to inadequate knowledge of the preventive dose; a problem of resistance to chloroquine slowly building within the target population; or to incorrect responses to survey questions.[4]

h. Seventy-nine percent of the mothers declared they are not deterred by the cost of chloroquine.

i. As seen in the table below, each of four common control measures against mosquitoes was known to less than half of the 346 mothers surveyed.[5]

Percentage of Surveyed Mothers able to identify alternative methods to fight against mosquitoes	
Mosquito nets	44%
Insecticide	46%
Elimination of breeding grounds	48%
Weeding	43%

j. Forty-two percent of mothers reported going to the animatrice for their chloroquine while 51% said they supply themselves from the CHW at the health hut.[6]

B. DIARRHEAL DISEASE CONTROL

Goal: To teach 50% of mothers how to prepare and administer ORT solution by the end of 18 months.

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[4] One likely partial explanation of the anomaly: the survey personnel were told to ask if the mothers or children had 'siburu' during the last 'hivernage'. We understand that 'siburu' is a generic word meaning loosely 'fever.' Thus, the reported cases of "malaria" are likely to be at least a little overstated.

[5] The original text says the table shows that each mother knew at least one method. The survey could show that, but the table does not and we have thus deleted the statement.

[6] This roughly approximates the division of interviewed others between those in villages with huts and those in satellite villages ('villages polarises'). This suggests that the system is working as intended, since the CHW is responsible for a health hut, while the animatrice is a health promotion agent in a village served by a health hut in another village.

In simple cases with no apparent signs of 1st degree dehydration, the home-prepared solution is used by CHW mothers and animatrices; it is composed of:

- 40 g of sugar (8 lumps)
- 3,5 g of salt (1 coffee spoonful)
- 1 litre of water.

Cases of diarrhea with signs of 2nd-degree denydration are to be treated at the HPs, where they use the UNICEF sachets that comply with international recommendations. The UNICEF sachets contain:

- 1,5 g of potassium chloride
- 3,5 g of sodium
- 2,5 g of bicarbonate of soda
- 20 g of glucose dioxide.

For 3rd degree dehydration, parenteral rehydration is recommended.

4. Observations

The ORT program is working and in demand, but it does have a number of problems which need to be addressed:

(1) reluctance of health professionals to fully endorse ORT;
(2) lack of credibility of home-made remedies;
(3) practice of prescribing antibiotics;
(4) desire for symptomatic therapy;
(5) reluctance of mothers to provide ORT before the child is clinically dehydrated; and
(6) payment for a consultation for diarrhea with mothers then sent away empty handed with instructions to make up their own ORT solution.

Some possibilities for resolving these problems are simple in theory, yet difficult to put into practice. The availability of sachets of ORS at the village level would "medicalize" the treatment, improving credibility and justifying a consultation fee. It might also, though not necessarily, reduce pressures for additional therapies such as antibiotics and stool-forming agents. However, the national policy, articulated in February 1986, limits sachet distribution to the HP level despite a strong case for broader distribution presented by Regional personnel.

The national policy is based primarily on economic considerations; insufficient supplies of sachets, which have been provided by UNICEF, prohibit broader distribution. While the national strategy will be subject to many of the same field problems as in the Project, the situation is worse in the Project area. Services have now been extended to the village level, unlike in the other regions, yet diarrhea patients receive no treatment in spite of their consultation fee. The ORT program would benefit if sachets could be

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available at the village level. Domestic sachet production is a possibility [illegible] feasibility study has recently explored this avenue.

Additional ORT problems need to be addressed through educational strategies, both in the media and in the field. The committees of mothers, as well as health committees, need to be targeted. Educational interventions need to be designed, field tested, and evaluated. How can we teach a mother to rehydrate her baby before the infant is clinically dehydrated? How can we teach mothers and health providers that antibiotics do more harm than good in the treatment of viral diarrhea? Solutions to these problems will not come easily and without experimentation. These concrete research questions need to be addressed.

C. THE EXTENDED PROGRAM OF IMMUNIZATION

Goal: To achieve a minimum 50% vaccination coverage in the 8 areas of the test zone within 18 months.

1. Strategy

The Project strategy is for officials to travel to the huts to carry out vaccination sessions. Such a strategy requires significant human resources and appropriate equipment.

2. Activities

The program has not yet started in the test zone. However, personnel training has taken place, as reported in Chapter III: Training. A draft of a Regional action plan was produced and is to be submitted for review.

For the moment, routine activities are simultaneously carried out under the EPI and through the mass campaign. Under the EPI, immunization against the seven target diseases is administered by the PMI mid-wives and the HP heads. Under the mass campaign, it is the Service des Grandes Endémies which ensures immunization in the event of an epidemic.

The Service des Grandes Endémies is responsible for the supply of vaccines and vaccination cards to the HPs through the health center.

Presently, with the assistance of UNICEF, the Regions of Kaolack and Fatick enjoy cold storage facilities under the National Extended Program of Immunization. The equipment in the test posts includes:

- an electric (or kerosene)* refrigerator
- a 22-litre icebox

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* There is a lapse in the original text, but it appears that 'or kerosene' was intended.

- a thermos flask for vaccine*
- cold accumulators (to maintain temperature in a thermal container)
- a thermometer
- some technical equipment (syringes, needles, etc.)

3. Findings of the Survey

Nineteen percent of mothers surveyed reported having been immunized against tetanus during last year; 73% said their children had been immunized.[10],[11]

In order to confirm these data, the survey made further inquiries which disclosed that 57% of mothers surveyed had vaccination cards and 53% had them for their children.[12]

4. Observations

Major management issues confronting EPI include financing, logistics, and surveillance. Immunization is expensive. Even if vaccines are donated by UNICEF, distribution costs are often high enough to prohibit vaccine delivery to the rural target groups. Specific costs include refrigeration, vehicles, gasoline, and medical supplies. It appears that the program must have some auto-financing in order to be successful. Furthermore, indications are that people are willing to pay for what is a proven effective service. The exact amount, in terms of what the program needs to function and what the population can afford, needs to be explored.

Vaccine distribution and delivery strategies need to be designed and tested. The national policy is committed to delivering vaccines to the Departmental level. This two-fold decentralization is a major step forward, and all efforts must be made to ensure that the strategy does not fail for lack of supplies, transport, or an adequate cold chain.

Expanding the program to the post level is somewhat more difficult. Theoretically, each post will receive a monthly supply of vaccines. This means that the supplies must be either obtained or delivered on a monthly basis, and that the post must have a sophisticated enough refrigeration system to store a month's supply. The local administration, in conjunction with UNICEF, has

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* Translation in doubt; original was 'un poste(or 'porte'?)-vaccin sur thermos.'

[10] Note that the Project has not yet begun an immunization effort!

[11] In the case of children said to be vaccinated, the questionnaire asked for which diseases immunizations had been given, the number of shots given, and where it was done. This data has not been tabulated.

[12] Unclear as to whether this is a percent of those saying they had vaccinations, or of all those surveyed. Note also that the questionnaire instructions called for the one notation if the card was seen by the survey agent, another if it was said to exist but not seen; we assume that the percentages given relate to the number saying they have cards.

recently completed a needs assessment study at the post level. Vaccine delivery could well be linked to supervisory visits to the posts from the health center. Perhaps the major obstacle to this solution is the need for an effective cold-chain monitoring system at the post level. The WHO has developed some excellent teaching resources, and a small number of chefs de postes have already been trained. An evaluation of the impact of this training should be made in due time.

Vaccine delivery presents far greater challenges. Obviously the post cannot serve as a single fixed vaccination site. Distances are too great and the population too dispersed. But how can we provide vaccines at the village level? The solutions are not clear, and again various strategies must be tested. Given the current low vaccine coverage rate, there is no doubt that there is a need for mass village campaigns. Unfortunately, the necessary manpower for such an undertaking is not available at the post level. The question is whether personnel from the Department or Regional levels can be recruited for the task. After the catch-up period, it is highly probable that a the head of a HP can manage the vaccination program, provided of course he receives the necessary help from other post personnel and the village CHW/animatrices.

Here again various strategies must be developed and tested. What functions can the CHW or the animatrice perform? Should days be set aside exclusively for vaccination, or should the HP head conduct a small session during each of his supervisory visits? The latter situation would motivate both the chef de poste and the villagers by underscoring the purpose of his visit. It would also give the CHW and the chef de poste an opportunity to see the villagers and to work within the clinical context during his visit. It might, however, interfere with supervision because of service pressures. Hence, the need for trial and evaluation.

Surveillance is the remaining major issue in the expanded program of immunization. Most of the target diseases are common. Given this situation, it is advisable to concentrate on improving coverage, and not to get bogged down in data collection. The number of vaccines given should be recorded, not only to help estimate coverage, but also to determine supply needs. Children, as well as their mothers, should each have an individual health card on which to record not only their vaccination status, but also the target diseases if they happen to contact these. This procedure will expedite the delivery of vaccines, and if needed can provide important epidemiological data. CHWs in the villages might also be asked to record the number of cases of certain diseases, for example measles. However, at this point in the program, the overriding objective should be service delivery supplying the vaccines and seeing that those who are in need get them.

Immunization is the backbone of primary health care. Vaccines can greatly reduce morbidity and mortality from the scourge of childhood diseases. The program can also be used to market broader educational objectives such as hygiene and growth monitoring. The credibility and effectiveness of any rural health care project is directly dependent on the success or failure of vaccine delivery. Hence every effort must be made to effectively implement the EPI. However, it must be underscored that EPI is easily the most expen-

sive and logistically difficult technical component. The challenges loom large.

C. GROWTH MONITORING AND NUTRITIONAL COUNSELLING

1. Strategy

At the Regional level there is not yet a defined strategy under the Project. However, a national strategy was adopted in February 1986.

2. Activities

This program is the fourth and last intervention to be executed under the Phase II Project. Unfortunately, it has not yet been launched, although training was provided for staff from various levels in 1984, as reported in Chapter III: Training.

Meanwhile, the current Ministry nutritional program, the PPNS, provides periodic nutritional supplements, education, and weighing sessions for 130,000 children. The service is delivered at the HP level and covers approximately 10% of the country's under-five population. Target groups include twins, the extremely poor, and children found to be underweight in maternal/child health clinics. Food and the necessary material to ensure adequate distribution are provided by Catholic Relief Services which is funded by USAID's PL 480 Title Program.

In Phase II of the Project, the intention was to extend the nutrition program to the village level and to broaden the target population to include the entire under-five population. The goal was to focus on primary prevention at the community level. To date the only signs of progress are a shipment of scales received at the Project office and reports of some personnel training.

In the meantime, the Ministry is developing a new policy in the hopes of introducing a nationwide village-level program. They aim to shift service delivery from the HP down to the village level. Recently, material has been developed, including scales, height-for-age measures, and individual cards, which hopefully will allow the program to be conducted by local non-Ministry personnel who need not be literate.

The Ministry has established the general policies and now intends to decentralize program administration to the Departmental level. Special efforts are being made to involve the Ministries of Social Development and of Agriculture, and various local political structures. The ultimate goal is to provide service for 50% of the country's under-five population.

Obviously, events on the national level are a source of encouragement for the Project. The Project area already has a well-developed infrastructure down to the village level. The two Regions are the ideal place to pilot the

new national program, which corresponds closely to the Project's original intentions.

The list of possible interventions for a nutrition program includes:

1) nutritional supplements
2) breastfeeding promotion
3) appropriate weaning foods
4) dry season gardening
5) growth monitoring
6) nutrition education
7) child spacing
8) nutrition rehabilitation units.

There is no shortage of literature available, and experiences worldwide are well documented. A number of points are clear. First, nutrition is a composite index of health status. The nutritional state affects all the other parameters of primary health care. Nutrition, for example, determines the effectiveness of the three previously discussed technical components. Morbidity from malaria and diarrhea, as well as the immune response to vaccination, are directly related to nutritional status.

The second major point is that nutrition programs, in order to succeed, must be demedicalized and multi-sectorial. A program relying exclusively on health personnel is doomed to fail. Other Ministries, such as Agriculture and Social Development, must be involved, as well as local structures such as rural councils and mothers' groups at the village level. In sum, marketing a successful nutrition program is a complex exercise in community development.

The two Regions have developed an impressive primary health care infrastructure, which now extends Regionwide to all six Departments. Village structures, health and mothers' committees, are already active. The Ministry of Social Development has been an active participant in the community development work that was necessary to build the system. Furthermore, personnel are already working at the village level. There is no doubt that, on the basis of existing infrastructure, this is a prime area in which to introduce a nutritional program.

Nonetheless, a note of caution is necessary. Nutrition programs are bold and complex. Unlike the other technical components, it is not just a matter of delivering a tangible service to the village level. The service is relatively intangible and the organization complicated. It would be foolhardy for the Project to embark on a regionwide program before the successful ingredients have been identified. This will require experimentation and evaluation.

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Conclusions and recommendations resulting from this review of the Project's work on the new technical components have been incorporated in the Summary and Recommendations chapter.

III. TRAINING

INTRODUCTION

The Project Paper for Phase II noted that " The backbone of Phase II will be an ambitious, multi-dimensional training component. ... Training will reach thousands of people from the village to the national level."

The objectives of the training effort were to:

a. Improve the training and supervision skills of Project personnel in the fields of community organization, preventive health care pedagogy, management information systems, vehicle maintenance and health education.

b. Introduce, test and support the new technical components relating to preventive medicine in all the six Departments to be covered by the Project.

c. Consolidate local community structures responsible for managing and supporting the primary health care delivery system and,

d. Improve the capacity of the Senegalese institutions which train health personnel and specialized personnel in primary health care.

The Project aims at achieving its training objectives by developing parallel and complementary training approaches: local seminars and overseas training or study.

These types of training are meant for the supervisory personnel (most of whom are also health care providers).[1] They, in turn, convey the experience they have gained to community health workers (CHWs): the CHWs, traditional mid-wives and members of village committees. This chapter attempts to shed some light on the training and its results. We shall base our investigation on information from the following sources:

+ documents available at the Project management unit
+ discussion with officials, and
+ surveys among involved villagers.

ALL FOOTNOTES HAVE BEEN ADDED DURING EDITING, WITHOUT EVALUATION TEAM REVIEW UNLESS OTHERWISE NOTED.

[1] The word 'supervisor' or a form thereof has been used to translate 'encadrement' in this chapter, although the latter includes management roles other than those usually thought of in the context of supervision.

A. TRAINING CENTER

1. Infrastructure, Personnel and Equipment

The Center is an old, state-owned, one-story building, which has been entirely renovated by the Project. Located inside the Service d'Hygiène, it includes:

+ a classroom for 50 trainees
+ a slide showroom
+ a secretarial office
+ a classroom for 30 trainees
+ two medium-sized classrooms for group work
+ a library.

This complex, formally established in 1985, has been expanded to include new, self-contained dormitories for the trainees. The dormitories have been completed and equipped but not yet formally "received" by the Ministry.

The Center itself was endowed with the necessary equipment and an adequate staff. As of April 1986, only the manager had not yet taken office. The staff consisted of:

+ 1 Administrative Director (a doctor by training)
+ 1 Director of Studies (a mid-level health technician)
+ 2 Trainers (CESSI Graduates)
+ 1 Librarian
+ 1 Secretary
+ 2 Custodians

This number has been reduced since April 1986, when both the Administrative Director and the Director of Studies were sent to the US for training. The former is obtaining a Ph.D. in Epidemiology and the latter an M.A. in Educational Science. The Acting Directors filling in for them have other responsibilities. For example, the Acting Administrative Director is also Fatick Regional Medical Officer, Chief Medical Officer of the Department of Kaolack and responsible for Grandes Endémies; the Acting Director of Studies is one of the Center's two trainers. This situation does not allow optimal functioning of the Center and cannot last until the return of the incumbents, due in 2 and 4 years' time, without jeopardizing the life of the Project at the health hut level.

2. Curriculum

The Curriculum is not exclusively related to medicine. There is an obvious concern for bringing to health workers knowledge in new areas which they may need to perform correctly their duties. According to the baseline document of the Project, the major training areas are:

+ Biostatistics

- Community Development
- Drug Distribution System
- Epidemiology
- Health Education
- Primary Health Care Delivery Management System
- Utilization and Maintenance of Microcomputers
- Technical Components
- Operational Research Techniques
- Pedagogy
- Training of Trainers, or Personnel Orientation.

In view of such a diversity of training themes, the significant number of people to be reached and the potential requests from other services, training sessions must be carefully planned to ensure a rational use of the premises, as the 1985 experience demonstrated.

B. STAFF TRAINING

1. Training of Trainers, General

The Center recorded a utilization rate of 30% higher in 1985 and early 1986. However, this rate becomes null as of May, 1986, reflecting inadequate preparation for the departure and replacement of the Director of Studies, who left in May for two years of training abroad.[2] Training activity is outlined in the tables in Figures 1 and 2.

2. Training of Trainers, Technical

There were five training sessions focusing on the technical components. They were limited to the Departments of Nioro, Kaolack, Gossas and Foundiougne (the test zone) and are listed in Figure 3.

3. Refresher Training, Supervisory Staff

Staff refresher training is reported in Figure 4; it exceeded the number of sessions planned.

4. Non-Project Training Activities

The Center was asked by the MSP to host a seminar on public health services management in February-March, 1985, and a seminar on odontology in April 1986. Except for these two cases, the Center has not yet opened its doors to meet non-Project Regional, or even national training needs. The main reasons seem to be lack of statutes and formal administrative regulations.

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[2] The evaluation was done in May, so actual activity after that time was obviously not known. We assume the report of "null" utilization means no training was planned after May, though Figure 1 suggests otherwise.

FIGURE 1 : THE PLANNING OF THE 1986 TRAINING SESSIONS

ACTIVITIES	JAN	FEB	MAR	APR	MAY	JUN	JLY	AUG	SEP	OCT	NOV	DEC
1. ORIENTATION IN ANIMATION FOR NEWLY ASSIGNED PERSONNEL	13-25	3-15										
2. EVALUATION OF TECHNICAL COMPONENT TRAINING	.....	3-15										
3. REFRESHER TRAINING: HEALTH POST OFFICIALS, DISTRICT SUPERVISORS, PHASE I. DEPARTMENTS			.....	24-27								
4. "JOURNEE D'ETUDE" ON THE EVALUATION RESULT ON THE TECHNICAL COMPONENTS			.....	5-8								
5. REFRESHER TRAINING FOR MANAGEMENT COMMITTEES OF COMMUNITY DEPOTS				.....	10-15							
6. EVALUATION WITH DISTRICT PERSONNEL, FOLLOWED BY TRAINING IN ORT				.....	17-22							
7. GROUP DYNAMICS				.....	27-29							
8. TRAINING OF INVESTIGATORS FOR PROCESS EVALUATION					.....	28-3						
9. TRAINING OF SANITATION SUB-BRIGADE PERSONNEL IN HEALTH EDUCATION					.....	5-17						
10. NUTRITION TRAINING OF SUPERVISORS AND TEST ZONE HEADS OF HEALTH POSTS					.....	16-21						
11. NUTRITION TRAINING OF CHWs AND ANIMATRICES					.....	23-28						
12. TECHNICAL COMPONENT TRAINING OF HEALTH POST HEADS AND MONITRICES						.....	1-12					
13. TRAINING OF CHWs, MATRONES AND ANIMATRICES ON MALARIA AND ORT TECHNICAL COMPONENTS						.....	14-16					
14. TRAINING OF THE REGIONAL TEAM IN MICRO-COMPUTER FUNCTIONING						.....	4-16					
15. REFRESHER TRAINING OF SUPERVISORS ON MANAGEMENT AND REPORT PROCESSING						.....		1-3				
16. EVALUATION AND FOLLOW-UP OF HEALTH PROJECT	?	?	?	?	?	?	?	?	?	?	?	?
17. HEALTH EDUCATION						.....						1-13
18. TECHNICAL REFRESHER TRAINING OF DISTRICT PERSONNEL						.....						1-31
19. QUARTERLY REFRESHER TRAINING OF CHWs OF THE SIX (6) DEPARTMENTS	1-30	.....	1-30	.....	1-30	.....						1-30
20. REFRESHER TRAINING, FAFFRINE CHWs						.....	1-30	.....				1-30

FIGURE 2 : TRAINING OF TRAINERS

SERIAL No.	DATE	SUBJECTS	PARTICIPANTS POSITION	NUMBER
1	APRIL 84	ANIMATION	- HEALTH POST HEADS	94
			- MID-WIVES	18
			- DISTRICT SUPERVISORS	9
			- "DS" SUPERVISORS	3
2	APRIL 84	ORGANIZATION OF POPULATIONS AND PEDAGOGY	- HEALTH POST HEADS	94
			- DISTRICT SUPERVISORS	9
			- "DS" SUPERVISORS	3
3	10-22 OCTOBER 84	TRAINING IN PEDAGOGY (DEPARTMENT OF KAFFRINE)	- HEALTH POST HEADS	17
			- MID-WIVES	3
			- OTHERS	4
4	[illegible] JUNE 84	TRAINING IN CHEMOTHERAPY AND MALARIA CHEMOPROPHYLAXIS	- HEALTH POST HEADS, DISTRICT SUPERVISORS and MONITRICES RURALES	26
5	AUGUST 84	TRAINING IN ORT AND NUTRITION	- HEALTH POST HEADS	8
			- DISTRICT SUPERVISORS	6
			- MONITRICES RURALES	8
			- REGIONAL SUPERVISORS	7
6	[illegible]-22 JANUARY 85	TRAINING IN PEDAGOGY (DEPARTMENT OF FATICK)	- HEALTH POST HEADS	16
			- MID-WIVES	2
			- DISTRICT SUPERVISOR	1
7	[illegible]-16 JANUARY 85	HEALTH EDUCATION (WHO-SPONSORED)	- MEDICAL OFFICER	1
8	13 JANUARY 85	ORIENTATION/ANIMATION OF NEW PERSONNEL (KAOLACK AND FATICK)	- HEALTH POST HEADS and MID-WIVES	25
9	13 FEBRUARY - [illegible] MARCH 1985	ORIENTATION OF PERSONNEL NEWLY ASSIGNED AND ANIMATION PEDAGOGY	- HEALTH POST HEADS and MID-WIVES	26
10	13-20 MARCH 85	HEALTH SERVICES MANAGEMENT	- DISTRICT SUPERVISORS	9
11	[illegible]-23 MARCH 85	PLANNING	- DISTRICT SUPERVISORS	8
			- MID-WIVES	9
12	13-20 MARCH 85	SUPERVISION PLANNING	- DISTRICT SUPERVISORS	9
13	13 MARCH - [illegible] APRIL 85	GROUP DYNAMICS	- REGIONAL SUPERVISORS, TRAINING CENTER PERSONNEL, MEDICAL OFFICERS, REGIONAL COORDINATORS, and PPNS DOCTORS OTHER REGIONS.	8

FIGURE 2 : TRAINING OF TRAINERS (continued)

14	27-31 MAY 85	CHEMOPROPHYLAXIS, CHEMOTHERAPY, ORT AND NUTRITION (FOR PERSONNEL NEWLY ASSIGNED)	- HEALTH POST HEADS, DISTRICT SUPERVISORS and MONITRICES RURALES	26
15	22-26 JULY 85	COMMUNITY DEPOT MANAGEMENT	- DISTRICT SUPERVISORS and HEALTH POST HEADS	39
16	JULY - AUGUST 85	PUBLIC SERVICES MANAGEMENT	- DISTRICT MEDICAL OFFICERS - HEALTH CENTER DOCTORS	? ?
17	19-24 AUGUST 85	EXPANDED PROGRAM OF IMMUNIZATIONS	- DISTRICT SUPERVISORS - HEALTH POST HEADS	7 6
18	SEPTEMBER 85	TRAINING OF CHW TRAINERS	- ?	?
19	14-19 OCTOBER 85	COMPUTER USE	- DISTRICT MEDICAL OFFICERS - REGIONAL SUPERVISORS	7 7
20	- same -	EXPANDED PROGRAM OF IMMUNIZATIONS	- DISTRICT SUPERVISORS - HEALTH POST HEADS	8 8
21	13-25 JANUARY 86	ORIENTATION AND ANIMATION (HEALTH PERSONNEL OF FATICK DEPT.)	- HEALTH POST HEADS - MID-WIVES - HEALTH AGENTS - HEALTH TECHNICIANS and SOCIAL ASSISTANTS	13 2 3 3
22	3-15 FEBRUARY 86	ORIENTATION AND ANIMATION (KAOLACK PERSONNEL)	- HEALTH POST HEADS - MID-WIVES - HEALTH AGENTS	15 6 3
23	7-18 APRIL 86	AUDIO-VISUAL (NON-PROJECT, MINISTRY SEMINAR)	?	15
24	21-29 APRIL 86	ODONTOLOGY (NON-PROJECT, MINISTRY SEMINAR)	?	?
	G R A N D T O T A L			591

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Figure 3 : TECHNICAL COMPONENT TRAINING

DATES	THEMES	PARTICIPANTS	No.
June 1984	Malaria Control	Health Post (HP) Heads, CM* Supervisors, Monitrices rurales	26
August 6 - 8, 1984	ORT and Nutrition	Reg. Trainers	7
August 16-18, 1984	ORT and Nutrition	HP Heads	8
		CM Supervisors	6
		Regional Supervisors	7
		"Monitrices rurales"	8
			29
August 19-24, 1985	Extended Program of Immunization	CM Medical Officers	7
		Regional Supervisors	6
			13
August 14-19, 1985	Extended Program of Immunization	HP Heads	8
		CM Supervisors	8
			16

*CM = "circonscription médicale", a medical district

Figure 4. Refresher Training, Staff

DATES	THEMES	PARTICIPANTS	No.
Sept 2-3, 1985	Reports management and processing	CM Supervisors	3
		HP Supervisors	40
Oct 10-11, 1985	Computer use	CM Medical Officers	7
		CM Supervisors	7
Feb 24-27, 1986	Community Depot Management[3]	HP Supervisors	48
		CM Supervisors	6
May 27-31, 1986	Malaria Control Measures	HP Supervisors	)
		CM Supervisors	) 26
		Monitrices rurales	)

[3] This and the next training session are not in Figure 2 but perhaps should be.

C. TRAINING OF COMMUNITY-LEVEL PERSONNEL

Community personnel are CHWs, traditional midwives and animatrices, as well as members of health committees and drug depot management committees, and managers of these drug depots.

1. CHWs, Matrones and Animatrices, General

Expansion Zone

In all, 120 training sessions have been held and 881 CHWs, matrones, and animatrices have been trained in the expansion zone; the details are in Figure 5.

Of the 632 CHWs and "matrones" operating in Kaffrine and Fatick Departments, 61 were interviewed in the survey;[a] 82% reported having been trained at health posts (HPs) and 8% at health centers.[b] For 97% of them, the duration of the training was a minimum of 4 weeks, and 38% reported that it lasted 12 weeks.

These latter cases are due to the fact that the tasks and functions which the matrones are expected to perform requires a lot expertise from them. Consequently, their training lasts three months in contrast to one month for the CHW's. Moreover, HPs whose maternities have too few clients send their matrones to other HPs and centers for training.

Test Zone[c]

Of the CHWs and matrones in the sample, 93% were trained at HPs, while only 7% (1 person) reported being trained at a health center. The questionnaire does not give any reason for this, but one of those interviewed had but five months work experience, while the rest had at least 4 years experience.

2. CHWs, Matrones and Animatrices, Technical

Of the CHW s and "matrone" s interviewed in the test zone,
- 93% had received ORT training,
- 79% had received malaria control training,
- 50% had received growth monitoring and nutrition training,
- 0 had received EPI training.

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[a] Unless otherwise stated, 'survey' refers to the sample surveys carried out as part of the mid-term evaluation in April-May 1986. Copies of the questionnaires used can be found in Annex III.

[b] One would have to check the data to explain the missing 10%; it may be a typographical error that has made 8% of what should have been 18%.

[c] The survey data in this section are based on a survey of 14 OF THE 110 CHWs and ABAs in the zone.

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FIGURE 5 : TRAINING BY HEALTH POST HEADS, EXPANSION ZONE

DEPARTMENT	HEALTH POST	1984 # SESSIONS	1984 # CHWs	1985 # SESSIONS	1985 # CHWs	1986 # SESSIONS	1986 # CHWs
FATICK	[illegible]	-	-	4	24	-	-
"	PATAR	-	-	4	28	-	-
"	NGAYOKHEME	-	-	3	6	-	-
"	DIALEHAO	-	-	4	20	-	-
"	DIAOULE	-	-	4	20	-	-
"	NDIOB	-	-	3	16	-	-
"	*BELLACADIO	-	-	3	16	-	-
"	THLTAGUIRE	-	-	4	20	-	-
"	.IARENE	-	-	4	20	-	-
"	DIOUROUP	-	-	3	10	-	-
"	FIMELA	-	-	3	6	-	-
"	.OUL-SESSENE	-	-	3	8	-	-
"	DIOFFIOR	-	-	3	8	-	-
"	[illegible]EMBA DIA	-	-	3	10	-	-
"	[illegible]ELODJI	-	-	0	0	-	-
"	[illegible]OCAR	-	-	0	0	-	-
"	[illegible]FAFACO	-	-	0	0	-	-
"	[illegible]VE	-	-	0	0	-	-
"	[illegible]RE NDIOLGUI	-	-	0	0	-	-
"	[illegible]	-	-	0	0	-	-
"	[illegible]RIN	-	-	0	0	-	-
KAFFRINE	[illegible]IE CM	-	-	7	88	-	-
"	[illegible]NE	-	-	5	71	-	-
"	[illegible]	-	-	4	32	-	-
"	[illegible]	-	-	3	33	-	-
"	NDIEBOUICK	-	-	3	27	-	-
"	MALEM HADDAR	-	-	7	66	-	-
"	GNIBI	-	-	4	28	-	-
"	BOUBEL	-	-	3	30	-	-
"	NDIEBENE	-	-	5	54	-	-
"	KHAIRA DIAGA	-	-	-	-	-	-
"	NGANDA	-	-	4	49	-	-
"	DIOKHA	-	-	-	-	(TRAINING AT DIOKOUL)	
"	PATE THIANGATE	-	-	2	15	-	-
"	* MADINATOU SALAM II	NPS?	-	(TRAINING AT NGANDA)		-	-
"	* DIANKE SOUF	-	-	(TRAINING AT MALEM)		-	-
"	* DIOKOUL MBELBOUCK	-	-	3	18	-	-
"	* [illegible]TE	-	-	(TRAINING AT NGANDA)		-	-
"	DARL MAHAME NPS	-	-	(TRAINING AT NGANDA)		-	-
"	KAHI	-	-	(TRAINING AT CM KAF.)		-	-
KOUNGHEUL	MAKA COP	-	-	2	26	-	-
"	MATERNITE KOUNGHEUL	-	-	10	52	-	-
"	SAINTES PATHE	-	-	2	16	-	-
"	LOUF-ESCALE	-	-	2	16	-	-
"	ROBOT	-	-	2	16	-	-
"	SABI	-	-	1	24	-	-

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Figure 6 : TECHNICAL COMPONENT TRAINING SESSIONS BY HP (TEST ZONE)*

SUBJECTS	HEALTH POST	DEPARTMENT		1984 # TRAINED	1985 # TRAINED		1986 # TRAINED	
1. ANTI-MALARIA MEASURES	GANDIAYE	FATICK	SEPT/OCT	11	-	-	-	-
	THIARE	"	JULY	16	-	-	-	-
	PASSY	FOUNDIOUGNE	"	14	-	-	-	-
	TOUBACOUTA	"	"	15	-	-	-	-
	MISSIRAH	NIORO	"	9	-	-	-	-
	MORAME	"	"	12	-	-	-	-
	MBAR	GOSSAS	"	11	-	-	-	-
	NGATHIE	"	"	22	-	-	-	-
				110				
2. ORAL REHYDRATION THERAPY	GANDIAYE	FATICK	AUGUST	11	-	-	-	-
	THIARE	"	"	16	-	-	-	-
	PASSY	FOUNDIOUGNE	"	14	-	-	-	-
	TOUBACOUTA	"	"	15	-	-	-	-
	MISSIRAH	NIORO	"	9	-	-	-	-
	MORAME	"	"	12	-	-	-	-
	MBAR	GOSSAS	"	11	-	-	-	-
	NGATHIE	"	"	22	-	-	-	-
				110				

*It was reported that two sessions were run for each HP and each subject, making 32 in all.

The data in Figure 6 from Project records are somewhat inconsistent with those from the survey. However, the both clearly indicate that training sessions were held for the malaria control and ORT technical components.

The CHWs and matrones have been transmitting their skills to the communities since July 1984, but this does not seem to have had an extensive impact. Of the 340 mothers interviewed from the test zones:

- 21% were well-informed about the physiology of malaria prophylaxis;
- 45% did not know any preventive dose for chloroquine;
- 89% took prophylaxis against malaria with chloroquine, especially during pregnancy; and
- 86% gave chloroquine to their children.[7]

It should be noted that chloroquinisation sessions are conducted under the surveillance and monitoring the CHW's and animatrices, making it unnecessary for recipients to remember the dose.[8] Such a procedure cannot and should not last forever.

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[7] Editing time has been too limited to permit checking of all data across chapters, e.g. those of this page with those on the same subject in Chapter II. Some footnotes in the latter Chapter apply here, too.

[8] We understand this to mean that the pills are taken in the presence of the CHW or animatrice.

For the control of diarrheal diseases, 84% of the mothers interviewed were aware of ORT and knew how to prepare the solution and 55% said they used ORT the last time their child had diarrhea.

The significance of the role of the community personnel is highlighted by the mothers' reports showing that 31% owe their knowledge to CHW's, 27% to the animatrices, but only 17% to HPs nurses.* Seventy-six percent of these mothers say they learned through demonstration sessions by community personnel and HP nurses, and 8% by listening to the radio.

3. Health Committees

According to the Project Coordinator, the health committees in the 8 test zones have had no training since 1984 as most of their members were chosen and trained during Phase I, and the Project decided that new committee members were too few to warrant a resumption of training for all. In the health committee training sessions in the expansion zone listed in Figure 7, 3,782 committee members were trained.

4. Management Committees

In all, 396 members of management committees for the pharmaceutical depots were trained in the "circonscriptions médicales" (CMs) of Fatick (17 committees), Kaffrine (12 committees) and Koungueul (4 committees), including the committee at the Health Center in each case. Each depot has a manager, all 33 of whom received training.

5. Refresher Training

Refresher training ("recyclage") has involved only the health personnel at the village level: CHWs, animatrices, matrones, excluding the health committees. In all, there have been 565 refresher training sessions, by Department:

Foadack	132	Nioro du Rip	168
Gossas	134	Foundiougne	104
Fatick	16	Kaffrine	11

In the test zone, 32 refresher sessions were reported for CHWs and animatrices on the fight against malaria and on ORT in June and August, 1985, one year after their initial training on these subjects.

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* This accounts for only 73%, presumably (but not necessarily) of the sample. The data make it possible to assess these answers for those who were able to answer the technical questions well (and separately for the others) to see whether one source (CHW or animatrice) seems to be more effective than the other. Similar issues and possibilities arise regarding the data in the rest of the paragraph.

FIGURE 7 : TRAINING OF HEALTH COMMITTEE MEMBERS

Health Post	1984	1985	1986	Health Post	1984	1985	1986
GANDIAYE	-	-	-	FAYIL	-	1	-
THIARE	-	-	-	*PALMARIN	-	1	-
PASSY	-	-	-	DIAKELARE	-	4	-
TOUBACOUTA	-	-	-	MBASS	-	3	-
MBAR	-	-	-	MABO	-	6	-
NGATHIE	-	-	-	NDIOGNICK	-	3	-
MISSIRAH	-	-	-	MALEM HODDAR	-	5	-
NDRAME ESCALE	-	-	-	GNIBY	-	3	3
NIAKHAR	-	3	-	BOUBEL	-	2	-
PATAR	-	4	-	NDIOBENE	-	-	-
NGAYOKHEME	-	1	-	KHAIRA DIAGA	-	-	-
DIAKHAO	-	3	-	NGANDA	-	4	-
JIOULE	-	3	-	DIMISKHA	-	-	-
NDIOB	-	2	-	PATHE THIANGAYE	-	3	-
MBELLACORDIO	-	2	-	MEDINATOUL SALAM I	-	-	-
TATTAGUIRE	-	3	-	*DIANKE SOUF	-	3	-
DIARERE	-	3	-	DIOKOUL OLBELBOUCK	-	3	-
DIOUROUF	-	2	-	*KATHIOTTE	-	4	-
FIMELA	-	3	-	*DAROU MINAME	-	3	-
LOUL-SOSSERE	-	3	-	KATHI	-	6	-
DIOFFIOR	-	1	-	MAKA YOP	-	-	-
SAMBA DIA	-	2	-	SAINTES PATHE	-	-	-
*MARLODJI	-	1	-	LOUR ESCALE	-	-	-
*TOUCAR	-	3	-	*RIBOT	-	4	-
*MARFAFACO	-	0	-	SALY MDIOUM SAINT	-	6	-
*FAOYE	-	1	-	C.M. DE KOUNGHEUL	-	1	4
*THIARE NDIOLOUI	-	-	-				
				TOTALS	0	105	7

* New Health Posts.

The HP heads in the 4 Departments in the Project since Phase I report that they gave quarterly refresher sessions in 1984 and 1985. In 1986, one session has been reported by all but two CMs (who did not produce any reports). A single 1986 session was also reported in the expansion zone. A special case arose in the Department of Kaffrine; there, in view of the delay in the training of the CHWs in this area, an intensive one-week upgrading session was organized by the heads of the operational HPs.

D. OVERSEAS TRAINING

1. Short-term Training

In June and July 1984, four officials from the central Ministry attended nutrition, family planning and primary health care courses in the US.

In August 1984, the CM Medical Officers of Nioro du Rip and Gossas, along with two officials from the Ministry were introduced to the techniques of community development at the University of North Carolina, USA.

During the same month the Regional Chief Medical Officer participated in a study tour of primary health care in Haiti; he also attended an epidemiology course in Talloires, France, in September and October.

In January 1985, the Regional Chief Medical Officer of Fatick, the Regional supervisor of Kaolack and the Kongheul CM Medical Officer went to an MSH management training course in Morocco.

In July and August, 1985, the Regional Supervisor of Kaolack attended a training program on community development techniques at the University of North Carolina, together with a woman instructor from the Training Center.

2. Medium and Long Term Training Programs

These programs were only initiated in April, 1986, when two senior officials were sent to the US, both for two years. The CM Medical Officer of Kaffrine is working for a Master's Degree (M.SC) in epidemiology, while the former Director of Studies at the Training Center is preparing a Master s Degree (M.A.) in Educational Science.

The long-term training programs is way behind schedule. By December 1988, 10 participants should have returned from overseas training, a schedule unlikely to be met, since only two have started such training.

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Conclusions and recommendations resulting from this review of the Project's training activities are found in the Summary and Recommendations chapter.

IV. SUPERVISION[1]

INTRODUCTION

The importance of supervision is particularly obvious in the case of the community health workers (CHWs), in such areas as selection criteria, training and responsibility. Supervision is the most effective way of providing information, orientation, instruction, consolidation, and corrective action.[2] It is a tool to be used for guiding and enhancing individual initiatives and for making objective observations of the work of the person(s) under the technical responsibility of the supervisor.

Since primary health care is carried out through a hierarchical system, it is imperative to set up a strong supervision system at all levels.

Having endorsed these concepts, the Medical Regions of Kaolack and Fatick set up a supervision system which was to be examined within the context of this evaluation. The issues explored were:

+ a supervision system with the means affordable to the Senegalese Government,
+ an epidemiological control and surveillance system to monitor the Project s activities,
+ devising methods for allowing the local communities to take charge of the Project's recurrent costs.

The evaluation of the Project's first phase identified six significant problems, three of which are supervision-related:

ALL FOOTNOTES HAVE BEEN ADDED DURING EDITING, WITHOUT EVALUATION TEAM REVIEW UNLESS OTHERWISE NOTED.

[1] To an outside observer, and increasingly to some insiders, there is a degree of confusion regarding "supervision" and "supervisors." The translation (in Dakar) of the French "encadrement" as "supervision" is indicative of this; everyone would agree that "encadrement" is provided by Health Post Heads, District Medical Officers, Departmental Medical Officers and the Project Director, as well as by people with the title "Supervisor," but agreement would be less likely if one suggested all of those people are responsible for "supervision." It is quite possible that this is because in the minds of many it is more or less equated with inspection ("supervision" was translated "inspection" in several places in the document; we have changed it back to "supervision," but the problem remains). This is implicitly acknowledged in section B.1 of the chapter by the remark on the limiting effect of having a Department Supervisor report to the person responsible for those whose work the supervisor "supervises." The call for job descriptions (see the Summary and Recommendations chapter) is a major step in the right direction.

[2] One might add "encouragement."

- [illegible] for management of the Project was not integrated into the existing Regional public health infrastructure, resulting in an inefficient utilization of MPH personnel resources.

- Incentive payments by the Project to the MPH Departmental personnel translated into a financial burden to be borne by the State.

- An improved system of vehicle maintenance and repair was vital to the village-related supervision activities.

Objectives: By the second year of Phase II, there was to be in place an efficient comprehensive supervisory system reaching from the health post (HP) to the central services of the Ministry of Public Health. It was to be capable of facilitating the transfer of the Project's management to the Ministry. This transfer will require planning, coordination and regular monitoring of the technical services of the Ministry of Public Health with USAID support.

A. THE SUPERVISORS

1. Overview

A National Coordinator of the USAID-sponsored Projects has been named, as planned, to facilitate the planning and evaluation of health projects. The coordinator also serves as a link between the Ministry of Public Health and USAID.

Plans called for the appointment of a Regional Public Health Care Supervisor, who is in place and acts as a coordinator of the various PHC components.

A statistician and a nutrition specialist to be assigned to the Project have still not been assigned, and are still needed.

Commitments have been met in terms of appointing two trainers for the Center, heads for new HPs, health agents for the test posts, Regional and Departmental Public Health Supervisors and Departmental Social Development Supervisors.

In addition to the absence of a statistician and nutrition specialist (never named), the positions of Director of Studies of the Training Center and Chief Medical Officer in the Kaffrine "circonscription medicale" (CM) are temporarily vacant, and that of Project coordinator is scheduled to be vacated soon when the present incumbent departs for long-term training abroad.

The separation of the two Regions and the present lack of physical facilities for the Fatick Medical Region headquarters are the sources of some problems.

2. Health Post Heads

Nine HPs were surveyed: 4 in the test zones, and 5 in the expansion zones. The survey[3] found that not all heads of HPs are nurses, and that their seniority in the profession ranges from 27 years to 6 months in the test zone, and from 41 years to 3 days in the expansion zone. Their time at the HP varies similarly, between 24 years and 6 months in the test zone, and between 5 years and 3 days in the expansion zone. When asked when they were informed about the Project, their responses ranged from 1978 to 1986, though it was limited to 1984 and 1985 in the expansion zone, where all are newcomers.

All the expansion zone workers were reportedly involved in setting up the Project. They took part in the sensitization and public information campaign, in the selection of CHWs and in the opening of the huts. They have also trained the village workers, as detailed in Figures 1 and 2.

Figure 1 : NUMBER OF CHWs TRAINED PER POST ("P")[4]

PARTICIPANTS	Test Zone				Expansion Zone				
	P1	P2	P3	P4	P5	P6	P7	P8	P9
						NF			
"Secouriste"	11	13	5	0	15		6	15	23
"Matrones"	11	13	5	2	15		5	15	23
Health Committee	11	13	5	0	15		13	0	23
Depot Manager	1	1	1	0	1		1	0	2
Mgt. Committee	1	1	1	0	1		1	0	1

NOTES: P4 = 6 months; P5 = disqualified

Figure 2 : REFRESHER SESSIONS PER HP[4]

PARTICIPANTS	Test Zone				Expansion Zone				
	P1	P2	P3	P4	P5	P6	P7	P8	P9
						NF			
"Secouriste"	20	8	1	1	1		2	1	1
"Matrones"	20	8	0	1	1		2	1	1
Health Committee	20	1	1	1	0		0	0	0
Depot Manager	20	2	1	0	0		0	0	0
Mgt. Committee	20	1	1	1	0		0	0	0

Refresher Sessions: Management problems (4) Bookkeeping (5)
Health/medical care (4) Other (6)
Pregnancy Monitoring (2)

[3] Unless otherwise stated, "survey" refers to the sample surveys carried out as part of the mid-term evaluation in April-May 1986. Copies of the questionnaires used can be found in Annex III.

[4] "NF" may mean "not functioning" and the "Secouristes" may be CHWs. The text does not clarify.

3. Department and Region-level supervisors

The role of the Regional supervisor is to oversee the work of their departmental counterparts; the latter are expected to plan, coordinate activities, and monitor the work of the HP heads and ensure their training and upgrading under the care of the Departmental Medical Officer.[a]

The supervisors' experience varies from one month to 10 years in the profession, from ten days to three years in their posts, and from six to eight years with the Project.

They all report that they supervise huts, the number per supervisor ranging from 52 huts to 141.

In the test zone, they conduct public information activities and train trainers in the technical components. In the expansion zone, they ensure regular coordination meetings, educational training and sensitization of communities under the Primary Health Care Program. Three of seven supervisors surveyed report having participated in the opening of 8, 4 and 18 health huts respectively.

These supervisors oversee the performance of the HP heads and the training they give the CHWs. They ensure an average of one refresher session per year, on such topics as record keeping, sanitation, technical components (e.g. ORT, malaria prevention), depot management, role of committee members.

As to their role in the activity of the Project, four of the seven responding to the survey reported that they participate in decision-making through coordination meetings, while the other four said they just take orders.

4. The Physicians

Of the 11 doctors in the Region, 7 were surveyed and 3 were absent.* They have spent from one and eight years in medicine and from one to six years in their present posts. Their knowledge of the Project ranges from two to five years.

They learned of the Project from (in order of importance) coordination meetings; daily field practice; a counterpart who worked in the Region; transfer of power; rural training.

Five of the seven doctors report that they arrived after the Project was launched; the other were involved in the whole process, from informing the local authorities to opening the huts. The number of huts opened by individual doctors varies between 9 and 36.

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[a] The original text from which the following paragraphs were taken is unclear as to whether it concerns the Departmental or the Regional supervisors, or both.

* There is no explanation of the whereabouts of the 11th.

The seven doctors report using USAID resources, but they supplement these with State and other means. USAID materials were found to be in good condition except for the motorboats.

Gasoline is regularly supplied by USAID, and also by the State and other sources. USAID is supplying between 140 and 250 liters/month, depending on field trip schedules. In their view, post-Project costs will be financed by the State, rural communities, health committees and cooperatives.

5. Social Development Workers

They were not covered by the survey, but from interviews and the review of Project files, it is evident that they played an active role during the Expansion phase, resulting in good organization of the communities and a good mastery of the Project's elements. In the test zone, there is currently no supervision by Social Development workers.[7]

6. The Center's Trainers

The trainers at the Center were newcomers. While they recognize that the supervision process is a way to identify needs for refresher training, and to verify the appropriateness of the training content to the work of the field personnel, they do not participate in supervision.

7. The Project's Office

All reports converge at the Project Unit. They are numerous, and it is difficult, if not simply impossible to go through them all. However, some important elements of the activity reports are the subject of discussion during coordination meetings.

B. THE SUPERVISION PROCESS

All of the supervisors, senior technicians, nurses heading HPs, and development agents have a monthly program. Each post head is expected to visit one of the health huts in his/her jurisdiction each month and, in the test zone, the satellite villages. Each Departmental Health Supervisor is expected to make monthly visits to all of the HPs in the Department and one hut dependent on each. The Regional Supervisors attend all coordination meetings and visit facilities for which problems have been reported. At the national level, oversight depends on timely collection of statistical data.

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[7] At the time of the evaluation, some felt that this was due to the transfer to the extension zone of vehicles they had been using. However, in the debriefing in December, the Project Director explained that Social Development Staff were supposed to play an active role only in the early phase of entering a new area, and that they were never expected to continue supervising project activities once they are launched in an area. In view of this clarification, the original references to the transfer of vehicles as having a negative impact on the Project activities have been deleted from the text.

Assessing the regularity of supervisory activities on the basis of the files was not an easy task. There are activities scheduled for which there are no reports, and vice versa. For example, in three files that should each hold 12 reports (one year), there were three, four and eight respectively.

The Regional supervisor coordinates the program* supervisors' activities (synthesizes activities) and also interacts directly with the HP heads and the CHWs.

The Department-level supervisor gathers reports on the huts from the heads of posts and transmits them to the Project Unit without analyzing them; they are not used to assess current activities or to plan for the future. He produces a personnel report on his visits on the basis of his observations of the day. The nature of the Project's filing system prevents verification that follow-up is given findings for which it action is indicated.

In the case of Fatick, it seems - lessons were drawn from past experiences and that the operating system observes the chain of commend. However, there is here an administrative loophole. The Regional and Departmental Chief Medical Officers are the real supervisors. The Departmental and Regional Supervisors work under their direction and are, in effect, delegated tasks.† Supervision reports, even those submitted to the Medical Officers, are not fully exploited at any level, from the health hut upward.

A vital role in supervision process is played by the system of coordination meetings that has been developed:

- for the Medical CMs - monthly, with the Medical Officer, HP heads and a Regional team member;
- for the Medical Region - monthly, with the CM Medical Officers, the heads of health centers, the Regional team, and on specific invitation, a member in the national team;
- for the Regional supervisors - weekly, with the Regional Chief Medical Officer and supervisors from various Offices (SMI, EPS, Hygiene, GE, Pharmacy, Project Office etc.);
- for Regional supervisors and training staff, monthly.

Feedback from the supervision visits are made during these coordination meetings where various problems are raised, and solutions are proposed and accepted.

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* This is the first reference to 'program supervisors;' they may be those referred to elsewhere as Department Supervisors.

† See footnote No. 1 at the beginning of this chapter.

Issues raised at CM meetings may suggest some basic or refresher training needs, or training is requested when a need arises in connection with a new activity. However, the way in which supervision reports are prepared does not allow relevant upgrading and training subjects to emerge.

If the supervision system were working well, many of the operational problems identified in the evaluation process should not exist. That they do exist is cause for concern over the supervision system. This is reinforced by impressions in the test zone of some confusion as to committee responsibilities and of a lack of motivation on the part of the CHWs.[10]

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Conclusions and recommendations resulting from this review of the Project's supervision system have been incorporated in the Summary and Recommendations chapter.

[10] The first two sentences of this last paragraph were added in editing, but are based on discussions with evaluation team members during the review meeting to develop the Summary and Recommendations chapter.

V. INFORMATION SYSTEM[1]

INTRODUCTION

Good Management needs good information:

- at the right time (i.e. in time to make corrections before damage is done)
- in the right form (i.e. so that the real problems are evident from the presentation of the data)
- in the right place (relevant data for decision making at the various levels in the hierarchy).

Good information should be complete and up to date, and only the necessary information should be collected. These considerations have been used as the norms for evaluating the existing Management Information System (MIS).[2]

The management information system agenda at the national level has long includes such issues as what types of information to collect and how to go about it, what types of information to transmit from one level to another, and which indicators must be considered for taking which decision. Moreover, experiments are under way with a view to improving the national system. However, a rural health project is more restricted and offers a privileged ground for the search for solutions to MIS problems.

The Project established a record-keeping system during Phase I to collect data relating to consultations, drug sales and vital statistics. Phase II aims to:

- consolidate previous accomplishments by establishing an efficient information system, the introduction of computerization and applied research; and to
- develop an epidemiological surveillance system to monitor and evaluate Project activities.

ALL FOOTNOTES HAVE BEEN ADDED DURING EDITING, WITHOUT EVALUATION TEAM REVIEW UNLESS OTHERWISE NOTED.

1 The present chapter is the result of the merging of two reports on the subject, one written in English, the other translated from the French. Each of the original reports contained sections explicitly responding to some or all of the specific information system questions of the Evaluation Terms of Reference. The content of those sections of the two reports has been absorbed into the present chapter, as well as into Annex II to this report, with the Evaluation Team addressed all of the Terms of Reference questions.

2 The expression 'management information system' is used throughout this chapter to include 'management' information (e.g. on drug stock levels, staff levels, workloads) as well as epidemiological and other purely 'health' information that is conventionally part of a 'health information system.'

However, for the initial two years which are the subject of the present evaluation, the following specific goals were to be met:

+ Analyze and transmit vital information to departmental authorities in a timely fashion.

+ set up a standard reporting system for the sixteen test villages.

To support this, the Ministry of Public Health was to assign a statistician to the Medical Region of Kaolack.

A. THE STRUCTURE

1. Background

The MIS is the business of all health workers of the two regions, but those agents most directly involved are the community health workers (CHWs), health post (HP) heads and supervisors. The information system links the hut to the Project office via the HP head and the Departmental supervisor. The tools of the MIS were basically registers at the level of the huts, stock cards at huts and depots, and registers and monthly reports produced by HP heads.

At the level of the huts, efforts were made to facilitate collection by providing forms with graphic reminders of the information to be recorded. Data were systematically collected by recording everything that happened in the hut: consultations, births, deaths according to presumed source (symptoms), sanitation data (latrine, refuse disposal, well protection, use of improved stoves), drug consumption. The CHWs applied themselves to systematically filling out their various registers. Much information on the demographic and health situation was generally available to them, particularly in the "selected huts" areas, following the 1980 restructuring. While the CHW registered considerable data, it fell to the HP head to record selected data from CHW registers for reporting purposes. The aggregating of this data each month was a tedious process which was part of their on-site supervision. Some of them produced graphics and endeavored to up-date the demographic data on a regular basis All these actions were mechanical and did not lead to any practical application in the decision making process.

Note that for the epidemiological situation, the mechanism used is subject to the BEAKSON paralogism, i.e., to an area not representative of morbidity in the populations covered by the health hut. This bias is almost a constant in the statistics of the health workers.

The conclusions of the 1982 evaluation (end of Phase I) can be summed up as follows:

+ The data pertaining to the hut attendance and village-based civil status were collected and systematically recorded.

+ The data recording system is not fully developed and its analytic capacity is thoroughly inadequate.

2. Phase II[3]

Overview

In past years various evaluations and special studies have been made on this subject, especially as input into the Project proposal for Phase II of the Project. (For example, consultant Patrick Kelly's report of December 1983 gives an excellent analysis of the problem, and comes with highly useful recommendations for rationalization and "simplification of the Information System. See Annex IV of the present report.) The current system has evolved from that established in Phase I; in fact, it differs very little from what it was two years ago, except for having expanded into the two additional Departments. Figure 1 presents an outline of the Project's MIS.

Figure 1 : SUMMARY OF PROJECT MANAGEMENT INFORMATION SYSTEM

LEVEL	RESPONSIBLE	RECORD/REPORT
At the Health Hut:	Animatrice	1. Report on support to ORT
		2. Report on support to Malaria (Palu)
	CHW	1. Recap of Pharmaceutical Stock records
		2. Monthly recap of Management Register (finances)
		3. Recap of Consultation REgister (number of patients)
	Matrone	1. List of births
		2. List of deaths
All reports at the health hut level are processed monthly.		
At the HP:	The Head	1. Nosological report: (births, deaths, consultations)
		2. Activity report of his Post
		3. Financial report (rapport d'autogestion)
		4. Synthesis of the reports of the Health Huts
		5. Report on Community Pharmacy (stock movements)
		6. Supervisory report on the Health Huts
		7. MCH report
		8. Report on EPI
		9. Report on PPNS (three monthly)
All reports at the HP level, with the exception of the PPNS report, are processed monthly. The Project coordinator receives Reports Nos. 5, 6, and 7 from the HPs.		
Departmental Health Center (Supervisor's Report - weekly)		Summaries & recapitulation of the reports of the HPs)
		1. Report on the epidemiological situation
		2. Report on births, deaths and consultations (nosologic)
		3. Activities of the Medical Center

[3] Note that the supervision system is a part of the information system in that it generates reports, and is a major (in practice, the only) source of feedback to those who report up the line. Because the Supervision System is dealt with in a chapter on that subject, it is not discussed here, but it should not be forgotten in this context.

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In brief, the system records and generates an abundance of demographic, epidemiological, financial (receipts, expenditures, balances), logistic (pharmaceuticals), and activity (consultations) information.

Notwithstanding all efforts in training and information, the result and quality of the reporting is rather poor on the village level. Moreover, the amount of effort required from the CHWs to record information relating to a host of variables is not reflected in the HP head's compulsory report, which gives only minimal global data.*

On the HP level the results are better on the whole, with some exceptions, but the demands the MIS makes at this level are substantial. To the normal demands of a health information system are added those pertaining to the technical components in the test zone, and those relating to the health huts (the HP heads must themselves record data from individual hut registers for their own monthly reports). Their reporting requirements are as follows:

+ Activity report	monthly
+ EPI report	"
+ PPNS report	"
+ Morbidity report	"
+ Malaria and ORT report	" (Test Posts)
+ Epidemiological report	" (Watch Posts)

Although this might be an acceptable workload if done regularly , it is a heavy charge for many HP heads, who have limited administrative skills, given that most of their training and experience are clinically based. Consequently, the health hut reporting which the Project imposes comes as an additional burden.

B. THE PROCESS

1. Information Flows

Too many reports are sent upward, with too much detail. The reports from the HPs are sent verbatim. They are not summarized, and this results in a deluge of reports and a heavy workload at the Project office. What is more, not all the information received at the Project coordinator's office is needed for management decisions. The number and detail of records and reports should and could be reduced, given the data necessary for appropriate management and supervision. A simplified system focusing on relevant data and using a reduced number of forms is described in Annex IV; it is taken from a 1983 consulting report and the Phase II planning paper.

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* Nor does the data recording and collection effort seem to be used in the supervision process.

At the Project Unit, data relating to the financial situation of the huts is reviewed and there is follow-up where appropriate. However, other reports transmitted in the form of raw information are simply filed. Thus, most of the statistical data produced with considerable effort are put to little or no use.

By contrast, the activity reports of the HP heads and supervisors are reviewed by the Project coordinator in the light of their plans of action. It is on the basis of such review, the evaluation team was told, that feedback is generated through the supervisory system. However, in evaluation team interviews with people at various levels, the answer to the question, "Do you get any feedback?" was invariably "No." Further questioning revealed that sometimes supervisors would give some verbal feedback, but this was more often a compliment or a criticism of the ability to fill out the forms rather than an analysis of what the data meant. Written feedback was non-existent. The lack of useful feedback was recognized by all the HP heads and supervisors, who deplore the lack of use of the information gathered. None of them has ever received a report on the health situation of their regions. This is also true at national level.

2. Information Needs

A key issue for any MIS is what information is needed by whom. In practice, one must consider the types of decisions the system must support at each organizational level, the indicators that will be most helpful in support of those decisions, and the nature and most accessible sources of the data needed to generate the indicators.

The evaluation team found no study of the types of decisions the MIS is expected to help and had far too little time to prepare such a study.[3] However, one of the evaluation team members did prepare the following outline relating responsibilities at two key organizational levels to broad statements of the kinds and present sources of data needed.

a. Heads of Health Posts

+ Financial data ("cahiers de gestion") from the health huts to supervise the handling of the money at the village level.

+ Data on supply and stocks of drugs, ("cahiers de stock," etc.) to control the use of the drugs and to ensure a regular resupply.

+ Data on number of patients, deaths, births, etc. to control the functioning of the health hut.

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[3] Broadly speaking, it is safe to say that the MIS will have to support the variety of decisions that are needed to ensure that services are being provided as planned, that programs are progressing at an acceptable rate toward their objectives and are "on track."

b. At the Departmental Level:

- The same data as at the HPs, plus..
- Financial statements to control the handling of money (including mobylettes).
- Stock data to control the dispensing and resupply of drugs.
- Epidemiological data to monitor the health situation.
- Statistical data, numbers of patients, etc. to monitor functioning of health center.

The Phase II Project Paper proposed a number of indicators to convey the information needed for monitoring of the various programs. These were,

1. Percentage of babies whose weight at birth is below the normal weight.
2. Child mortality rate.
3. Percentage of child mortality rate due to exogenous factors.
4. Proportional mortality rate of under fives.
5. Proportion of active health huts.
6. Mean number of consultations per health hut.
7. Average proceeds per health hut.
8. Average amount of cash on hand per hut.
9. Average contribution per consultation.
10. Proportion of febrile cases.
11. Proportion of cases involving a serious cough.
12. Proportion of diarrheal cases.

In real life, the production of indicators requires processing the raw data recorded far beyond the aggregating now done. Such processing is not the rule at any level of the health system structure or in the Project. The training given the health personnel, particularly below the level of the Regional Medical Officer, does not equip them to do their own statistical analysis of the data they record themselves or collect from lower levels of the system. Meanwhile, the Project Unit has a microcomputer which could greatly facilitate data processing, but there is no one to undertake that task. The statistician which the Ministry was to assign to Kaolack has not been named. It is understood that a decision has been made to send to Kaolack the ATS who is presently in Thies under the implementation programs of regional offices of statistics, but this decision has not yet been implemented.*

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* One might also point out that the value of an indicator is in depicting a current state relative to an expected, acceptable, or desired state; if the present value is outside the acceptable range, action is needed. The appropriate first action is often obtaining more information to find out why it is outside the range. Once that is known, one can identify and take steps to correct the situation. Project design provides some objectives, and there may be other objectively verifiable characteristics of an effective primary health care program that could usefully be identified. Then acceptable ranges would

Finally, one question that was raised but not answered by the evaluation is whether the reliability and the level of comprehensiveness of the data communicated limit their usefulness or utilization for the monitoring of programs.

C. INTEGRATION

There are two Information Systems, one for the government (MSP), and one for the Project. The Project system leads directly to the Project Coordinator who analyses (some of) the data and acts accordingly through the supervisors at Departmental level. However, the Regional supervisor (at the Regional Office of the M.S.P.) claims that some data needed by the Ministry, on malarial chemotherapy for example, stays at the Project office.

In the long run, the Project's information system should not exist. It is needed now in some form at least to permit monitoring where exclusively Project funds are concerned. However, the Project should be able to get the service and health information it needs through the Ministry's regional system of information. While this may pose some practical problems, it is clear that, sooner or later, the Project information system must be completely integrated into the Ministry system in order to avoid both conflicts and parallel systems.

To summarize, the present information system consists of a large number of reports moving up the managerial hierarchy. This necessitates a heavy workload for personnel who are at the lower levels of the system and are not really trained for administrative work. Project management receives a large number of reports which require a lot of time to be analyzed. At various levels the complaint is often heard that data which is really needed is not received. One also gets the impression that it is not always clear what information is really needed at the various levels of management and supervision in order for them to carry out their tasks. Finally, there is a tendency to have two separate flows of data; the flow through the administrative system to the Ministry, and the flow to the Project Unit.

Conclusions and recommendations resulting from this review of the Project's Management Information System have been incorporated in the Summary and Recommendations chapter.

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have to be defined for each, taking into account the resources available, an expected rate of progress and similar factors. The Kelly report mentioned in the text and attached in Annex suggests some sets of indicators and ranges.

During phase II there is to be a reinforcement of the distribution and procurement system of essential medicines from the regional depot down to the drug shelves of the most remote health hut in the region, and the system is to be expanded into the two departments of the expansion zone.

A. STRUCTURE

The system is described in detail in Annex V and is outlined in Figure 1. Orders move from the bottom up, goods from the top down.

Figure 1 : DRUG DISTRIBUTION AND PROCUREMENT SYSTEM

LEVEL		STRUCTURE	RESPONSIBLE AGENT	HEALTH AUTHORITIES INVOLVED IN THE ORDERING PROCESS
ADMINISTRATIVE	HEALTH			
National	MPH	DAMOET (Central Drug Depot)	Pharmacist	-PNA Pharmacist
Regional	Medical Region	Regional Depot (building renovated by AID)	Regional Pharmacy Depot Manager	-Region-level Pharmacist -Depot Manager -Project Coordinator
Department	Center	Departmental Depot (2-3 metal cabinets)	Medical Officer Supervisor	-CM* Chief Medical Officer -Supervisors -"APS"
Arrondissement ("chef lieu") Rural Community	Post	Community Depot (2-3 metal cabinets)	Health Post Head	-Health Post Head -Management Committee:President Treasurer, Depot Manager
Village	Hut	Metal Cabinet	CHW*	CHW informs HP head directly with signatures of the president and treasurer of the Management Committee

* CM = "circonscription medicale" or medical district; CHW = community health worker

The depots established to date are indicated in Figure 2. Note that of the Community Depots in Figure 2, 47 are in the test zone and 31 in the expansion zone. Another 13 are to be created very soon in expansion zone.

Figure 2 : PHARMACEUTICAL DEPOTS

	Initially Planned	In Place
Regional Depot	1	1
Departmental Depots (at Health Centers)	9	9
Community Depots (at HP's)	34*	78

* There appears to be no documented figure for the number of planned depots. This figure was provided by the Project coordinator.

The records to be kept and the levels of the system at which they are found are shown in Figure 3.

Figure 3 : RECORD-KEEPING SYSTEM

Management Level: Documents	Huts Management Committee	Community (HP) Depot	Health Center Depot	Regional Depot
Stock File	-	x	x	x
Purchase Order	x	x	x	x
Inventory File	-	x	x	x
Order Book	x	x	-	-
Management Book	x	x	-	-

The supervision of the system is the responsibility of the CM, Department and Region Chief Medical Officers assisted by the Departmental and Regional supervisors.

B. OPERATIONS

1. Procurement

In the test zone, 92% of the CHWs interviewed claimed to have at their disposal drugs to meet the needs of the rural populations (i.e. the products they stock are what the people request) and 50% of the CHWs and 73% of the animatrices declared that they had not experienced any stock-outs. The other side of the latter issue is that the other 50% did experience stock-outs. In the expansion zone, 52% of CHWs surveyed reported having had stock-outs, most commonly of aspirin (cited by 26% of CHWs), followed by

chloroquine.[4]

The drug list established appears to fit local needs well, but with two-thirds of the villages reporting stockouts, one must question the extent to which a regular supply of products is being maintained. Nevertheless, one member of the evaluation team felt that "the distribution and re-supply system of essential drugs to the health huts at the village level is working satisfactorily. ... Most of the re-supply problems are at the lowest levels, at the health huts, usually due to a poorly developed sense of responsibility, either with the CHW or the management committee. But also these problems are exceptions. As a rule the villagers get their medicines when they want them."[5]

2. Financial Viability

One of the objectives of the Project is to ensure financial viability for the huts, each of which is to be considered "financially autonomous and self-managed, independent and able to maintain its initially granted operating funds."

ALL FOOTNOTES HAVE BEEN ADDED DURING EDITING, WITHOUT EVALUATION TEAM REVIEW UNLESS OTHERWISE NOTED.

[4] We have been told that the CHW survey data comes from both CHWs and matrones, sometimes one of each in a single village. The result of this is that some villages get counted twice in data based on "CHW" responses. Initial analysis did not take this into account. While there has not been time during editing to review all of the calculations in this light, the stock-out issue was reviewed. Five of eight reporting villages in the test zone, and 23 of 34 in the expansion zone (63% and 68% respectively) reported having had stock-outs in the previous six months. Where stock-outs were reported, nivaquine was out in 6 of the test zone villages and 44% of the expansion villages, aspirin in none of the test zone but in 9% of the expansion villages. Other products were reported out less often. Note that there were cases of conflicting responses from a single village; e.g. in 9 cases in the expansion zone one person reported stock-outs, and nine said there were none. In the above calculation, we have assumed in such cases that the village had a stock-out, since (a) matrones may not be aware of them, and (b) it seems more likely that a stock-out was forgotten than that they are erroneously reported as having occurred. These data by village have been inserted in the text of the Summary and Recommendations, and in Chapter I.

[5] The quotation is from consultant John Lion's report. Perhaps he is right, but it is hard to consider "satisfactory" a system allowing stock-outs in half its outlets in the past few months (the period for which they survey answers were sought). This 50% figure, however, is just an indicator which calls for more information: first, the frequency and duration of the stock-outs, then the reasons. One two-day stock-out in one product in half the huts over three months is not the same as two-week stock-outs in several products in the same huts over the same period.

Financial viability is judged on the basis of the following formula,

cost of current stock
- cost of outdated stocks
+ cash on hand
+ value of initial allotment
+ revenue from fee charges

Huts with positive balances are declared financially sound.[3]

The survey[4] covered 43 committees and, on the basis of the viability formula, found just over 20% of the committees sound and a similar percentage inviable (negative balance). Nothing can be said about the other 56% (24 committees), as the essential data (value of initial allotment, value of out-dated stock, etc.) are lacking for one reason or another. In fact, one finding of the survey and field visits was that registers and other records (see Figure 2) which should show how well the depots are working, as well as the nature and seriousness of any problems they are having, are poorly kept. Among other things, only 20% of the HUTs keep copies of their drug purchase orders.

Among the other [illegible]

+ Officials at HCs and Centers "borrow" drugs stored on their premises but earmarked for the HUTs [illegible] to replace the "borrowed" drugs. This is a symptom of the national system's inability to provide all the drugs needed at the HC and HP levels. The same problem may arise at the Region level, particularly if the health hut supply system is merged with the national system in the future; there is a real risk that priority will be given those closest to the supply: hospitals, centers, posts ... leaving the huts last in line.

+ The destruction and replacement of expired drugs pose some problems due to the complicated system in use. This may result in distribution to the patient of expired drugs. Also the lack of sanitation or cleanliness and careless handling of the drug supply may cause spoiling before the official expiration dates.

+ Instances were found of HP Heads taking the place of the health committee in drug management. This may be a matter of convenience, but it makes the problems cited above more likely to occur.

+ Drugs not on the official list have been found at various levels of the system.

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[3] We would assume that huts with zero balances are also judged viable.

[4] Unless otherwise stated, "survey" refers to the sample surveys carried out as part of the mid-term evaluation in April-May 1988. Copies of the questionnaires used can be found in Annex III.

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- Sanitation and cleanliness at the APs give a negative picture. Dirt and dust abound, boxes with medicines are often not closed and collect dirt, the handling of the drugs is done with unclean hands, etc. Everyone in the system is trained in sanitation, but little seems to be retained or practiced.

The supervision process should have been identifying problem areas and bringing about corrective measures. The impression of the evaluation team is that "supervision" now involves little more than assembling and forwarding various documents to the Project Unit without analyzing and/or acting upon them. In fact, the main role of this activity seems to be to justify the use of the gasoline provided by the Project.

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Conclusions and recommendations resulting from this review of the Project's pharmaceutical supply system have been incorporated in the Summary and Recommendations chapter.

II. FINANCING RECURRENT COSTS[1]

INTRODUCTION

Over the last decade, Senegal has experienced some serious economic hardships, specially inflation and instability in the public sector, coupled with the stagnation in exports and difficulty in mobilizing national savings. Hence, the limited resources allocated to health, whose share of the national budget has regularly declined since 1975. (see Figure 1).

Figure 1 : GOVERNMENT BUDGETS, TOTAL AND HEALTH, 1972 -1983

FISCAL YEARS	MILLION CFA National Budget	Health Budget	Health as % of Total
1972 - 73	44,000	3,797,874	8.6
1973 - 74	47,000	3,656,818	7.8
1974 - 75	55,000	4,102,882	7.5
1975 - 76	71,000	5,067,186	7.1
1976 - 77	80,000	5,247,326	6.1
1977 - 78	89,000	5,369,908	6.0
1978 - 79	101,000	6,133,801	6.0
1979 - 80	106,000	6,572,014	6.2
1980 - 81	115,044	6,698,202	5.8
1981 - 82	130,104	6,946,000	5.3
1982 - 83	151,453	8,280,000	5.5

Senegal's health budget obviously falls well short of the 9% of the total national budget advocated by the WHO.

The State has adopted a recessionary policy. A new short-term Economic and Financial Adjustment Program (1985-1992) has been prepared. The present plan is one of consolidation, aiming at clamping down on recurrent costs. Indeed, no sooner were the preliminary work sessions for such a plan launched than the Ministry of Planning and Cooperation outlined the necessity for focusing on operating costs with priority given to the maintenance and rehabilitation of existing materiel and infrastructure.

A seminar and a workshop were held in this regard, in November 1983 and July 1984 respectively. Among the issues discussed were the recurrent costs of the Primary Health Project. This was just a step towards making the Senegalese State aware of the significance of recurrent costs. This problem is becoming ever more acute, because most projects under the VIIth plan are

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ALL FOOTNOTES HAVE BEEN ADDED DURING EDITING, WITHOUT EVALUATION TEAM REVIEW UNLESS OTHERWISE NOTED.

[1] This chapter is the result of two separate reports dealing with this subject. Because each of the reports treated the subject rather differently, their reports have been kept essentially intact, the one constituting Part A of the chapter, the other Part B.

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financed by external donors and the State is expected to take responsibility for recurrent costs after the donors withdraw.

Since the Rural Health Project is almost entirely sponsored by USAID, a way must be found for the State to absorb recurrent costs of Project activities. Recurrent costs of the are defined as all costs generated by the Project and incurred repeatedly on a more or less regular basis. This, therefore includes the following elements:

+ Gasoline for vehicles and mobylettes
+ Drug allotment to the community-based depots
+ Energy costs (water, electricity, telephone)
+ Maintenance of vehicles and mobylettes
+ Maintenance of premises (Training Center, health facilities)
+ Costs of the Project Unit (e.g. secretarial, gas, office supply and vehicle maintenance expenditures).
+ Local personnel charges, including costs of on-site visit, and of initial and refresher training, including per diem.

A. OVERVIEW

1. Transportation-related Costs

Gas allotment for supervision varies according to the supervision program at various administrative levels. It depends on the surveyed distance, the consumption of the vehicles per km, and the mileage. Nevertheless, an average 200 litres per month was allocated to Region and "circonscription médicale" (CM) levels, and a 10 litre allotment was fixed at post-level. The 7-10 liter per post allotment is deducted from the allotment to the CMs. In the course of the field survey,[2] we were advised by CM medical officers that their allotment was between 170 and 250 litres.

The gas bill is borne by USAID-Dakar. Gas coupons are sent to the Project office which ensures the dispatching. When the questionnaires sent to the health authorities (doctors, health post (HP) heads, supervisors) were examined, all agreed that gas was provided by USAID. The State and other entities were also cited as sources, but the evaluation team was unable to document the allotment for supervision activities. The team was advised that the State will take over from USAID the cost of gasoline.

It was the team's impression that most of the health authorities with whom the matter was discussed had some misgivings about the advisability of gas procurement being ensured by a source other than the State (such as communities or health committees) for fear of interruptions in the supply. Supervision activities being paramount for the Project's survival, a non-stop procurement in gas is essential.

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[2] Unless otherwise stated, 'survey' refers to the sample surveys carried out as part of the mid-term evaluation in April-May '86. Copies of the questionnaires used can be found in Annex III.

In this connection, a 1983 survey of CM activities showed that the gas allotment to the Ministry can cover the monthly supervision of the HPs, monthly CM meetings, displacements to PNA and the needs in supervision of the mobylettes. The survey indicated that it is possible to cover all CMs, except for Nioro, Kaffrine, Fatick and Koungheul which, despite the large number of HPs under their supervision, are allotted just as much as the small CMs. These conclusions remains valid three years later, but with the recessionary policy initiated by the public authorities, there has been a reduction in fuel allotments. It would be helpful if the Ministry would review the allotment of gasoline to the Regions generally, with particular emphasis on the Project Regions, and base them on the findings of this survey.

Mobylette maintenance costs may be borne by some committees, but they are not reported in the ledgers consulted during the evaluation. Indeed, recorded costs are often aggregated and it is not always easy to break them down into discrete line-items. While it has not been possible to determine how many health committees have incurred mobylette maintenance and repair costs, some positive suggestions were made by some committees. One was an increase of CFA 25 on each product sold at the depot (by package, not by unit) and the eventual use of the 2% monthly health committee "miscellaneous" budget line item for maintenance and small repairs of mobylettes. In the 1983 survey mentioned above, these costs are estimated at CFA 18,925 per annum (of which CFA 15,000 to be generated by increasing the drug prices and CFA 3,925 from the 2% monthly miscellaneous line-item).

Some HP heads let it be known that they are prepared to support mobylette repair costs up to CFA 5,000; beyond that level, they say the Project will have to bear the charges.

3. The Training Center

Presently, a major part of the Training Center's operating fund is financed by USAID, along with the salaries if a secretary, a watchman, a chauffeur and a cook-production technician. As shown in Figure I of Annex VI, from April 1984 through June 1986, the expenses generated by the Regional Training Center totaled CFA 5,583,516.

Note, however, that not all the expenses of those 26 months are really recurrent costs. One can roughly consider the 1984 costs as installation costs and the remaining CFA 2,318,820 as recurrent costs, an average of CFA 1,987,560 per year.[3]

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[3] This may be a little overstated because the sewer connection charge was large and is not a recurrent cost. On the other hand, this is a short period on which to estimate operating costs.

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In addition to these costs of operating the Center, there are also direct costs linked to the number of people trained; by far the most important is "per diem". According to data provided to the evaluation team, from June 1, 1984 through May 31, 1986, these costs amounted to some CFA 42,323,200.[4]

The State is expected to pay the salary of the Center's Director now in training in the USA. As a "technicien superieur" by virtue of his university education, his annual salary is estimated at CFA 1,380,000.

3. Other Recurrent Costs

Replacement of Vehicles and Mobylettes

Presently, there are 22 vehicles all donated by USAID, and 82 mobylettes of which 48 were donated by USAID and 34 by UNICEF. It is worth noting that the first allotment in mobylettes was entirely provided by USAID, UNICEF replaced old ones. In November 1984, the 34 Peugeot 154 L2 mobylettes cost CFA 7,384,800.

There has been some success in having rural committees commit themselves (in writing) to replace the mobylettes used by supervisors to visit the villages. It was not possible to obtain the total number formally committed, but the team was advised that 17 rural communities in Kaffrine and Fatick had sent their proceedings to the Project Unit. In other Departments, there has been correspondence with the Project Unit, but nothing has yet been concluded. Thus, the percentage of rural communities in the overall Project area which have given their commitments in writing is still low, at 23%.

From the survey of Governors, Prefets, Sous-Prefets, Presidents of Rural Communities, and Heads of Multipurpose Rural Expansion Centers, the consensus seems to be that the most favored source of funding for the renewal of the mobylettes is the rural community budgets, and that with greater sensitizing of the communities, the Project could be auto-financed. A revision of rural community budget rules was suggested to meet new expenditures which had not been anticipated in the current budget line items.[5]

Pharmaceutical Products

The initial stock of drugs in community-based depots is financed by USAID. The wages of a manual worker and an auxiliary worker are also paid by USAID. Cash payments result from sale of drugs (and services) and it is up to the nuts to resupply themselves through the depots, which purchase from the National Pharmacy. A rapid review of the financial documents for 1985 and the first quarter of 1986 made available at the Project, showed that depot account was constantly well funded and that after purchases, there remained a balance of CFA 10,000,000. Therefore it is assumed that no major drug supply problems have occurred yet.

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[4] In the second part of the Chapter (B. Financial Analysis), a slightly different figure is given for a two-year period starting and ending two months earlier, and explicitly identified as 'per diem' costs.

[5] The replacement of both mobylettes and vehicles is discussed at some length below in section 9.2.

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It would have been useful to obtain the exact amount spent on drugs, but this was not possible because the data collected were patchy. It is, however, worth noting that the Kaolack Regional Pharmacy spent CFA 2,417,495 between May 1, 1984 and June 6, 1986. This figure includes drug conditioning costs, supplies, repairs, personnel salaries, etc., and thus does not say much about drug costs. A comprehensive survey in the near future will provide more reliable information on drug costs.

Evaluation costs

USAID sponsors a project evaluation every two years. The GOS will want to conduct field evaluations in order to consolidate achievements and make readjustments with the view to further expanding the Project to other Regions. It is not clear that the GOS will be able to provide the level of funding USAID has made available for evaluation activities; the cost of the mid-course evaluation of April-May 1986 period is estimated at CFA 5,186,941.

4. Potential Sources of Recurrent Cost Financing

Thus far, the State remains the main source of financial support for health services, either with domestic or external funds. The problem now is whether alternative sources can be found to ensure the financing of some of the recurrent costs of this project.

Community-based participation

Populations can contribute to financing some costs of the Project through,

+ user fee contributions
+ drug purchases
+ contributions
+ community work
+ health committee budgets
+ donations by some community members
+ organization of profit-making events.

They might also be able to finance the drug allotment to health huts and give incentives to community health workers.

In a foreseeable future, it is possible that the renewal of the mobylettes can to be financed by the "Communaute Rurale" budget.

The "Région Médicale"

The integration of the Project into the "Region Medicale" (RM) will prove to be cumbersome, according to various management officials at both RM and Project levels. There also appears to be some fear of weaknesses that would result from such a merger and be difficult to resolve. Indeed, when one compares the budgets of the RM and the Project, that of RM looks like a drop in the bucket. (see Figures 2 and 3 of Annex VI)

The 1985 budget allocated to the Paolack RM, the Regional Laboratory, the Regional PMI (Child and Mother Care), the Paolack CM and health education totals some CFA 14,742,000,* while the Project's operating costs alone stand at CFA 81,300,000 million. This estimate is very conservative, indeed, neither the gasoline, nor the drug cost are included. If one considers the previous years, the annual operating and maintenance costs of the Project is to the tune of CFA 182 million (see detail in Figure 4 of Annex VI).[7]

A survey of recurrent costs undertaken in 1984 produced a recurrent cost index of about - %; that is, annual expenditure was equivalent to about 40% of the Project installation costs. The installation cost of this project was CFA 539,[illegible]50,000.[8]

At a series of meetings between the public authorities and AID officials, the 20 Sous-Prefets were unanimously in favor of taking over the recurrent costs. All six Prefets also endorsed the idea, but the two Governors were more reticent. They are concerned that there may be a generalized effort to get them to absorb recurrent costs created by other Government agencies. Nonetheless, the proposed discussions between the Ministries of Decentralization and Public Health to see whether an exception can be made, with appropriate changes in the laws.

Overall, the Regional administrative authorities were in favor of the rural communities taking responsibility for recurrent costs, but they indicated that State participation is not ruled out. There is an increasing awareness that populations must effectively be involved, but a certain amount of concern is expressed about the size of the financial burden to be borne by the populations and there is fear of eventual disengagement by the State.

Clearly, with the withdrawal of USAID, certain Project generated costs will disappear. Nevertheless, managing the Project will be cumbersome for the RM accountants who are not familiar with all the Project data. For a harmonious integration of the Project with the RM, it would be desirable to begin now involving the RM accountant in the Project's financial activities.

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* The original draft (p.9) attributed this budget to the years 1981-84, but the total is that of the items labeled 1985 in Annex VII-A.2, and Project costs with which the comparison is made are for 1985, so we have identified the Ministry budget here as also that of 1985.

[7] These last statements seem a bit exaggerated. Time does not permit the research required to verify or correct them, but Part B. Financial Analysis of this chapter looks at some of these items in considerable detail, and we offer the following observations on some of the statements here.

a. The Project expenses of CFA 81.3 million does include an item "vehicles" which is either short for fuel (it's about the right level; 3 months fuel in 1984 cost CFA 4.2 million), or it is initial purchase of vehicles which is not usually a recurrent cost (but allowance for replacement might be).

b. The drug costs are supposed to be financed by drug sales and are thus not a cost the Medical Region would have to take over.

c. The CFA 182 million figure cited for prior years was attained only in 1983, and half of it was drugs.

[8] It is unclear whether the 1984 study was of this project, or of one or more other projects.

expenditures for the two-year period. However, a large amount of this is likely to be attributable to start-up costs, such as purchase of equipment and hiring of contract labor which together make up about 40% of the Project office expenditures. In any event, the Kaolack office is to be closed at the end of the Project, which will result in the elimination of most of the related expenditures.

3. The Vehicle Fleet

Automobiles

Exhibit 3* shows the actual expenditures by vehicle for repairs, maintenance and fuel during the calendar year 1985. This information was summarized from data compiled by the Harvard team from the actual invoices and vehicle logs. It covers 20 vehicles, which is two less than the actual fleet of 22, but can be considered to be reasonable accurate due to the fact that one vehicle stolen during 1985 was just recently replaced. The accuracy of this breakdown can be verified by dividing total repairs, maintenance and parts on Exhibit 1* by two to arrive at a yearly estimate of $7,705,294 which is roughly comparable to the total of $7,608,509 for these items which is seen on Exhibit 3*.[10]

Exhibit 5* shows that fuel is the dominant component of vehicle operating costs, making up over 58% of the total cost, exclusive of course, of vehicle replacement costs. Repairs made up a full third of the cost and routine preventive maintenance accounted for only 8.6%. On the bottom of Exhibit 5*, the relative operating costs per kilometer are shown, separated by vehicle type. These costs were obtained from the data shown on Exhibit 4*, which summarizes the costs by vehicle type. One's attention is immediately drawn to the very high cost of operating the Peugeot 404 diesels. Looking back at Exhibit 3*, it can seen that the total repair and maintenance bill for two 404 diesels came to $1,728,181, which is 56 % of the same figure for seven gasoline 404's.

Going back to Exhibit 4*, it is curious to note that the average fuel cost tends to go down with the age of the vehicle. This may be partially explained by the fact that the more time a vehicle spends in the repair shop, the less time it is out on the road burning gas.

Exhibit 4* was used as the basis for developing a model that projects vehicle operating costs in the future, given a series of assumptions about performance, usage and a number of other macroeconomic variables such as the domestic price of fuel and the local inflation rate. Due to the scarcity of historical operating costs by vehicle type, it was necessary to estimate the increasing cost of repairs according to their respective ages. For the purpose of modeling, the annual escalation factor was estimated to be 64% of the previous year's expenses. That is, if 10,000 CFA was spent on repairs during the first year of operation of a vehicle, then the second year expenses could be expected to be 16,400 CFA and the third year 26,896 CFA.

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[10] 2,701,460 + 2,421,676 + 10,287,446 divided by 2 = $7,705,294

* Exhibits will be found in Annex VII.

This figure of 4% was obtained by fitting an exponential curve to existing data of vehicle cost by age. Again, due to scarcity of data, some degree of extrapolation was involved. However the projected expenses are not inconsistent with comparable studies performed by the health economist in other countries. Exhibit 6* shows the increasing costs of repair of a Peugeot 404 over a service life of 5 years. In the first year, repairs represent 3.7% of the original purchase price of the vehicle. By the fifth year, these have increased to 20.1% of the replacement cost and 27.3% of the original vehicle cost. However, as a vehicle ages, there comes a point where the interruptions for repairs become so frequent and so disruptive to Project activities, that the vehicle must be retired and replaced. For purposes of this model, that time cutoff is estimated to be 4 years and the model automatically replaces any vehicle that completes four years of service.

For the purpose of this evaluation two separate vehicle fleet scenarios are presented. The first shows the vehicle fleet composition and estimated operating cost for the years 1986 to 1990 assuming that the same 22 vehicles that are currently in service continue in operation and are replaced with the same type when they wear out. These projections are shown in Exhibits 7* through 8. The next set of projections, contained in Exhibits 11-13*, illustrate the effect of gradually scaling back the size of the vehicle fleet, arriving at a stable level of 13 permanent vehicles by 1989.

The assumptions used for both scenarios were as follows: The inflation rate for the five-year period will 8% per annum and will affect fuel, maintenance costs and the purchase price of new vehicles. Repair costs, as mentioned earlier, are calculated using the 64% per annum cost escalation factor. (Please note that the assumptions on Exhibits 8* and 11 show this figure to be 18%, so it is important to point out that this means 1 + .18 to the third power, which equals 164%--a 64% increase over the previous year) The 1986 tax-exempt fuel prices were assumed to be 260 CFA per liter for gasoline and 170 CFA per liter for diesel. Vehicle fuel consumption was calculated from the actual vehicle logs and ranges from 11.8 MPG for the 404 diesels to 25.3 MPG for the Renault R12's, with a fleet average of 20.4 MPG. The metric equivalents of these fuel consumption rates are 20.0 liters used per 100 kms for the 404 diesels, 9.4 liters per 100 kms for the R12's and a fleet average of 11.6 liters per 100 kms. The model assumes that with every additional year of life, a vehicle will consume 5% more fuel than the previous year. Taxes and registration fees may not be relevant after the vehicles become the property of the Senegalese government, but the amounts involved are small and have been left in the total computation. Similarly, insurance costs have also been left in. Although the government self-insures its own vehicle fleet, the premiums charged by the insurance companies are a market reflection of the risk involved in operating a vehicle and this should be included as it is likely that someday the government will have to repair or replace a vehicle involved in an accident or compensate third party victims. The model also calculates a sinking fund which shows how much money must be set aside every year in order to have sufficient cash to buy a replacement at the end of the vehicle's life. However, the sections at the end of Exhibits 9* and 13 reflect the actual cash outlay needed to pay for the vehicles being replaced in that year.

* Exhibits will be found in Annex VII.

Exhibit 7* which contains three pages, shows the composition of the vehicle fleet by vehicle type and age, assuming that the existing level of 22 vehicles is maintained. On the last page, the weighted average age of the entire fleet is shown to fluctuate between 0.9 and 1.7 years. This is due to the fact that the average is dominated by the 10 one-year old vehicles which are purchased in a block.

Exhibit 8* is a collection of 6 two-page summaries of the individual projected operating costs of each type of vehicle, again assuming that the current level of 22 vehicles is maintained. Please note that the Peugeot 504 is no longer manufactured, so the calculations were made with estimates about its successor, the Peugeot 505.

Exhibit 9* summarizes the operating information for each vehicle type from Exhibit 8*. The third page of Exhibit 9 shows this information for the entire fleet, with subtotals for variable operating costs (fuel, repairs and maintenance), total operating costs (includes fixed costs) and finally the total cost of operating plus the cost of purchasing new vehicles. These projections represent the actual cash outlays that will have to be made in order to keep the fleet on the road.

Exhibit 10* shows the present composition of the vehicle fleet, the current assignment of each vehicle and its final disposition, according to the preliminary agreement reached with Project management during the field trip to the Kaolack office. As was established earlier, 9 vehicles are to be retired, leaving the 13 permanent vehicles.

Exhibits 11* through 13 are analogous to Exhibits 7* through 9, except that they reflect the gradual phaseout of nonessential vehicles. Rather than actively retiring a functional vehicle, the model simply does not replace it when it wears out. This may also be an appropriate tactic in the practical implementation of the phaseout plan. On page 3 of Exhibit 11*, the fleet strength can be seen to stabilize at 13 permanent vehicles.

Exhibit 12*, like Exhibit 8, shows the cost operating each vehicle type, taking into account the number of vehicles in each category. Note that the Peugeot 505 (504) disappears immediately and the 404 diesels wear out in 1987 and are not replaced. Looking at the third page of Exhibit 11*, the model can be seen to purchase four new vehicles in 1988, which is to be the final procurement of vehicles by USAID.

Exhibit 14* shows the savings to be realized from scaling down the size of the vehicle fleet as depicted in Exhibits 11* through 13. The savings range from 19.1% in 1986 to 53.6% in 1990. The sharp drop seen in 1990 gives a false sense of security. The only reason for this decrease is that no vehicles are replaced in 1990. However, from the last page in Exhibit 11*, it can be seen that four vehicles will be purchased in both 1991 and 1992 and five more will be required in 1993. The operating costs to be borne by the government during 1989 and 1990 are 15,051,000 CFA and 17,389,000 CFA respectively. However, in 1989, five more vehicles will require replacement at a total cost of 23,523,000 CFA, bringing the total outlay for 1989 to

* Exhibits will be found in Annex VII.

30,574,000 CFA. This represents a 72% increase over the entire GOS 1985 non-personnel operating budget for the Regions of Fatick and Kaolack (32,915,500 + 143,581,000 = 176,496,500 CFA). From this perspective alone, it would appear that supporting this level of expenditure is beyond the economic means of the Government of Senegal. In 1987, the fuel bill would be some 7,843,870, representing a 65% increase over the 1985 combined fuel budgets for Fatick and Kaolack. (4,552,000 + 7,419,000 = 11,971,000). Even adjusted for an average 6% level of inflation, this additional fuel cost still represents a 40% increase over the budgeted level.

There is no accurate data on the cost of fuel used for supervision versus the amount used for administration, so a model was created to estimate the amount required for the nine Circonscriptions Medicales to supervise the 94 HPs in their jurisdiction. From this model, which is presented in Exhibit 15*, it can be concluded that an large percentage of fuel costs are attributable to non-supervisory activities. The model calculates the amount of fuel required to make a round trip to each HP from the C.M. that is charged with the responsibility of supervising it. Since the distance from the C.M. to the HP is known, the amount of fuel required to complete the trip once a month to each HP can be accurately calculated. This is a conservative calculation, because it is possible to combine visits to several HPs in a single day, thus reducing the total mileage to be driven. The model calculated that a total of 2,187,024 CFA would be required to visit each of the HPs monthly. Exhibit 16* illustrates a comparison between a) the amount of fuel purchased by USAID, b) fuel tickets sent to the Project office by USAID, and c) fuel tickets issued to project vehicles. The first two items need not necessarily agree, since they do not take into account existing inventories at either USAID or the Project office. The final two items should be reasonably close, since it is presumed that USAID will not send a new batch of tickets until the Project office advises that it is nearly out of them. The actual shipments do not appear to be out of line with the reported usage by the vehicles.

When one combines the estimated fuel cost for supervision of 2,187,024 CFA (see Exhibit 15*, last page) with the estimated mobylette fuel usage of 2,932,355 CFA which is shown in Exhibit 16, the total of 5,119,379 is far surpassed by the total fuel usage of 10,641,156 CFA which can be found at the bottom of Exhibit 3. This suggests that more than half of all fuel consumption is used for non-supervisory activities.

Mobylettes

A fleet of 94 mobylettes will be required to supervise the 694 villages on a monthly basis. As noted above, this will cost 2,932,355 CFA a year, or 4225 CFA per village ($12 U.S.). According to data compiled by the Harvard team in Kaolack, average repairs cost approximately 32,750 CFA per mobylette per year. If 94 mobylettes are in service, this means that the total repair bill should come to about 3,078,500, or 4,435 CFA per village ($13 U.S.). It would seem reasonable to expect that a village of 350 people would be able to find a way of raising 8,660 CFA ($25 U.S.), since this is only 25 CFA per person per year, assuming they perceive supervision of their health hut to be a desirable service.

* Exhibits will be found in Annex VII.

the replacement cost of the mobylettes is a different situation. The expense involved is not very material on an individual basis, since the purchase of 74 mobylettes every three years would only [illegible] a cost of 40,635 CFA per village (74 x 300,000 divided by 5744). This translates into an additional 39 CFA per person per year. Nevertheless, the villages have expressed a reluctance to finance mobylette purchases. A total of 17 rural communities have agreed in principal to finance the purchase of replacement mobylettes. However, there is a legal obstacle which prevents local governments from financing non-investment activities.

4. Training Activities

Per Diems

As can be seen in Exhibit 1*, per diems paid in connection with training activities accounted for an entire third of local currency expenditures. Exhibit 17 shows a detail of these expenditures which was compiled from Project documents supporting the disbursement of per diems to village health workers and village health committees for initial training and subsequent retraining (recycling) during calendar year 1985. There is some evidence that these documents are incomplete and that the actual amounts are higher, although the total on page 2 of Exhibit 17 of 19,744,000 CFA is roughly comparable to the two-year total of 44,058,000 CFA which was recorded in the local currency account.

Exhibit 17* shows that 88.4% of all per diems paid for training were paid to village health workers receiving their original 30 day training. By comparison, the per diems paid for recycling of CHW's was only 5.6% of the total paid.

A health worker therefore receives 500 CFA a day for thirty days for a total of 15,000 CFA (about $43 U.S.) for the entire session. In a country where the income per capita is only 133,344 per annum (1984), this per diem allotment is equivalent to over a months earnings, which is not at all insignificant, especially when one considers that the residents of rural villages are likely to be among the lowest income group in the country and well below the average income per capita.

The level of per diems to be paid in the future is not clear, but in simple terms, it can be computed as follows: If one assumes that the annual desertion rate among CHW will be 20%, then the per diem cost of training replacements will be 694 x 2 people x .20 or 278 people to be trained at a cost of 15,000 CFA each for a total of 4,170,000. To this must be added the cost of recycling 1388 (694 x 2) people three times a year at a cost of 500 each for a total of 2,082,000 CFA. The final figure to be considered is the cost of training 694 village health committees for two days at 1,500 CFA per committee. This totals also 2,082,000 CFA. The three different components add up to 8,334,000, which is considerably less than the 22,000,000 per year average seen in the local account. This can be attributed to the fact that the target areas were being expanded during this period, causing training expenses to exceed what might be considered to be a normal maintenance level. Nevertheless, eight million CFA of additional recurrent costs still repre-

* Exhibits will be found in Annex VII.

sents a considerable burden for the government of Senegal and may have to be scaled back in order to make the amount more manageable. It is not known how prospective village workers will react to a reduction in per diem expenses, which may now be a factor motivating enrollment in training. However, it is important that it be firmly established that there are other factors motivating a village health worker aside from the payment of per diems.

Training Center

The training center in Kaolack is so new that it is difficult to determine its future operating costs. From Exhibit 14, it appears that the costs incurred since the training center was opened are about 5,053,000 CFA (49,111,134 minus 44,058,070). However, once the dormitory becomes functional and the center begins to operate normally, it is likely that there will be a significant increase in operating costs, especially since the largest expense line item was for supplies (3,649,620).

5. Pharmaceutical Supply

The drug system is working properly at the village level. Information obtained by the evaluation team indicates that the villages are collecting sufficient funds to replenish their supplies of drugs at the health huts. However, the irregular supply of drugs from the PNA (the national drug supply system) has resulted in stockouts at HPs in the Project area. This in turn has caused the head of the HPs in the areas to request drugs from the health huts which are provided without compensation, thus effectively decapitalizing the village financing mechanism.[11]

An additional component of uncertainty will be introduced in the near future when the Kaolack pharmaceutical depot becomes a Regional distribution center. The main risk to the primary health care system will occur when the Kaolack depot begins to supply the Kaolack Regional hospital. It is possible that this will result in the further depletion of essential items such as chloroquine, aspirin and bandages.

6. Recapitulation

Additional financial analysis will be required to work up a detailed budget for the phasing out of USAID funding and the absorption of the remaining Project activities into the structure of the Ministry of Public Health. This study should begin at once, since it is necessary to begin implementation as soon as possible in order to provide for a smooth transition. Some major expenses, such as vehicle expenses and fuel can be reduced automatically by simply not replacing them when they wear out. Other expenses such as personnel and supplies, will have to be reviewed by Project management.

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[11] As noted in the chapter on this subject, survey responses regarding village stock-outs raise question as to how well supplies are being maintained at the level of the huts, and lead us to wonder whether the system is working as well as is here suggested. See Chapter VI. Pharmaceutical Supply.

• Exhibits will be found in Annex VII.

both USAID and GOS, to determine how they will fit into the new structure. Special attention should placed on the elimination of all non-essential expenditures, since the Project in it's present form is far too expensive to survive without external assistance. The expense of operating and replacing the 15 vehicles in 1989 will cost 38,573,967 CFA. When combined with the cost of per diems paid in connection with training and recycling activities of 19,744,000 CFA per year, the total reaches 58,317,967 CFA which represents a full 11% increment over the 1985 non-personnel budget for the Fatick and Kaolack Regions. Clearly, this is a formidable burden.

- 9 -

Conclusions and recommendations resulting from this review of recurrent cost issues have been incorporated in the Summary and Recommendations chapter.

A N N E X E S

I : TERMS OF REFERENCE QUESTIONS

II : SUMMARY REPORT, Dr. ROBERT CUSHMAN

III : EVALUATION SURVEY QUESTIONNAIRES

IV : M.I.S. : "THE KELLY REPORT"

V : DRUG LOGISTICS SYSTEM

VI : FINANCIAL OVERVIEW - TABLES

VII : FINANCIAL ANALYSIS - EXHIBITS

VIII : FINANCIAL ANALYSIS RECOMMENDATIONS

A N N E X I

TERMS OF REFERENCE QUESTIONS

A N N E X I

TERMS OF REFERENCE QUESTIONS

Meeting the Criteria

I. Project extension to the Kaffrine and Fatick Departments

1) How many villages were initially to be provided with health huts?

The objective was to open 255 health huts; 316 were actually established (112 in the department of Fatick and 204 in the department of Kaffrine), which far exceeds the projected numbers.

2) How many health huts are there with:

a) health committee?

All visited health huts have a health committee.

b) staff trained during these two years?

All visited huts have two (2) Community Health Workers (CHW) per hut (1 first aid worker./sanitarian and 1 trained birth attendant).

3) Among these health huts:

a) - 62% have CHW's who have been working there for 12 months or more;

- 38% have CHW's who have been working for 9 months. No defection among the CHW's was noted.

b) - All visited huts have the standard material (as based on the list provided by the project office).

- As for drugs, it is hard for us to judge their adequacy. However, half the CHW's surveyed responded they had very often been faced with shortages especially of: aspirin-26%, nivaquine-21%, alcohol-15%, bandages-10%, iron and paregoric 8%.

c) Among the visited health huts:

- All health committee members are elected.

- 17 out of 43 committees meet on a regular basis (only once a trimester).

- As for financial soundness, 9 out of 43 committees show positive results; 10 show negative results and for 24 (or over 56% of all committees) no conclusion can be drawn. Most data was missing which raises the question of the proper maintenance of management books.

II. Introduction of the new technical components

1) Diarrhea control program

a) at the 8 test posts:

(1) Categories and numbers of trained personnel:

- 1 chief medical officer of the region
- 1 Primary Health Care (PHC) supervisor
- 1 technical component supervisor
- 3 training center instructors
- 1 project coordinator
- 6 Department-level medical service supervisors
- 8 Health post chiefs
- 8 Agents of social development ("monitrices rurales")

(2) 100 village level workers including:

- 16 village health workers
- 84 animators ("animatrices")

b) Teaching material

(1) Developed and used:

- Advertizing posters
- Data sheets (see attachments)

(2) Used

- Slide presentation

2) Oral Rehydration Therapy (ORT) was used at the following levels:

a) village level:

Mothers, animators and CHW's actually use the homemade solution (water, salt, sugar).

b) health post level:

Health post chiefs use the homemade solution as well as the Oral Rehydration Salts packets.

c) Other levels: not considered at the time of the evaluation.

3) What proportion of mothers know:

a) the utility of ORT:
% to be calculated by Diané.

b) how to correctly prepare the solution?
to be calculated

c) how to administer the solution?
to be calculated

d) how to administer the solution?
this question cannot be answered

e) when to administer the solution?
this question cannot be answered

f) when to refer the child to the appropriate health units?

4) what proportion of mothers have used ORT more than once:

to be calculated

5) what proportion of mothers have resorted to the "animatrice" for counsel on ORT?

- 92/163 or 56% of the women of the villages covered have.

6) what proportion of health personnel (physicians, nurses, midwives) have prescribed ORT 10 times or more in cases of diarrhea.

- only one health post chief stated using the ORT 36 times.
- one responded 0 time
- the others varied in responses

2) Extended Immunization Program:

a) what is the strategy defined?

- the Strategy is being developed

b) Is there any trained personnel?

- 6 Department level chief medical officers
- 6 Department-level medical supervisors
- 1 technical component supervisor
- 1 regional-level supervisor
- 8 health post chiefs
- 3 instructors

c) what equipment is available?

Concerning the equipment planned under the projet, nothing has yet been made available.

It is to be noted that the MPH has equipped the health posts under the national Expanded Program of Immunization (EPI). The equipment includes but is not limited to:

- one electric or gas operated refrigerator
- one 22-liter ice-chest
- one vaccine carrying cold box
- reusable ice packs
- one thermometer
- technical equipment (syringes, needles, sterilizers)

It should also be noted that all test zone health posts are fixed vaccination sites for national EPI activities.

The delay in the availability of project material is due to the delay in activating the Bellagio plan for EPI.

d) What activities were conducted under the national program:

The following activities were undertaken as indicated by the survey findings:

- 19% mothers were immunized against tetanus.
- 73% stated they had their children immunized
- 50% mothers held their children's immunization cards.

These immunizations were undertaken by the Endemic Diseases Service team, the health post chiefs and the Mother and Child Care Center (Protection Maternelle et Infantile) midwives.

90

3) Growth monitoring and nutritional surveillance

a) What is the strategy defined?

There is not yet the slightest suggestion of a regional strategy. It is to be noted here that the national strategy is just beginning to be developed in February 1986.

b) Is there any trained personnel?

There are 29 trained agents including:

- 7 regional-level officers
- 6 department-level medical service supervisors
- 8 health post chiefs
- 8 "monitrices rurales"

c) What material is available?

Under the project, the material planned is not yet available although scales have arrived but will not be distributed until the national strategy is completed (see Colonel Sy).

Nevertheless, there are scales and monitoring cards at the health posts under the national nutrition program - Programme de Protection Nutritionnelle et Sanitaire- (PPNS) and UNICEF.

e) What activities were undertaken? by whom?

Under the project, activities have not started yet except for the PPNS and the national Maternal and Child Health Program (Service Maternel et Infantile).

4) Malaria control

a) What is the strategy defined ?

1) Chemioprophylaxis

Age groups	Rates	Nb tablets
0 - 1 year	50 mg	1/2 tablet
2-3 years	100 mg	1 tablet
4 - 5 years	200 mg	2 tablets
15-49 years	600 mg	6 tablets

2) Chemiotherapy

Age groups	Intake methods		
	Day 1	Day 2	Day 3
0-1 year	1/2 tablet	1/2 tablet	1/4 tablet
2-3 years	1 tablet	1 tablet	1/2 tablet
4-9 years	2 tablets	2 tablets	1 tablet
10-14 years	3 tablets	3 tablets	1 1/2 tablets
15 and over	6 tablets	6 tablets	3 tablets

b) What percentage proportion of the target population benefited from the program?

86% of mothers stated that their children had chemioprophylaxis. 89% of women have it during their pregnacy.

c) what drugs and materials are available:

(1) Materials available:

- microscope (provided by the tuberculosis control program)
- microscope slides
- petri dishes

(2) Drugs:

- Chloroquine

III. Criteria for identifying a method of supporting recurrent costs:

1) Amount of fuel used for supervision activities per administrative level (region-department - health post)

The region and department level medical services receive an average 210 liters per month.

It should be noted that it is the departmental level which supplies the health posts over a 7 to 10 month period.

2) Source of fuel

The study revealed that the main source fuel was USAID. However, 5 of the physicians stated that they used fuel supplied by the GOS or by other sources.

12

3) Number of rural communities which have established a commitment for replacement of the motorbikes:

17 out 72 rural communities have discussed the motorbike replacement issue.

Reminder-letters were sent to the "préfets" for the continuation of this operation.

4) Number of regional administrative authorities favoring the support of recurrent costs?

IV Project Information and Management System

1) Was the data collecting personnel properly trained?

The records of the training center contain some traces of training and retraining of personnel in report management and use and in computer operation.

However, our field observations revealed that:

- 56% of inventory books were unusable
- the statistical data are not analysed at any level
- the non-existence of basic training in report management and use.

Based on the above, the appropriateness of the training is questionable.

2) Types of information collected on the field

Concerning the birth, death and medical consultations books, the CHW's record the:

- identity
- health problem
- treatment (for the consultation)
- payment

For the inventory book, they record the :

- dates
- inputs
- outputs
- stock balance
- remarks

For the management record book (on a daily basis):

- cash balance
- daily receipts
- daily expenses
- cash balance at day end
- treasurer's signature (on a daily basis).

In the test zones, the CHW's and "animatrices" complete the statistical data sheets.

Of all the information collected at the huts, only the items contained in the health huts monthly reports are transmitted to the various levels

3) Time schedule for submitting activity reports

Normally, reports are sent at the end of each month. The project office records revealed a few deficiencies in the report filing procedure.

4) What happens to these progress reports?

As indicated earlier, the statistical reports are kept at the project office and at the regional medical offices.

Only the progress reports from the health post chiefs and supervisors according to the established work plan, are analyzed by the project coordinator and become the subject of feedback during coordination meetings or individual meetings with the health post chiefs or supervisors.

5) Is there any feedback? If so, how is it conducted and used?

For an answer, see previous question. There is no feedback between the CHW and the health post chiefs as the latter do not use the reports.

V. Personnel training

- There are 24 sessions for the training of trainers.

- The number of training sessions for CHW's by each instructor varies from one zone to the other and according to the year. Thus, in 1984, in the test zone, there were 2 training sessions per health post chief. In 1985, in the extension zone, the number of training sessions for CHW's was:
  . 17 committees for the Medical Service of the Department of Kaolack
  . 12 committees for the Medical Service of the Department of Kaffrine
  . 4 committees for the Medical Service of the Department of Koungheul

- There were 5 training sessions for the training of trainers under the technical components.

- There were 32 training sessions for CHW's and "animatrices" under the technical components: ORT and malaria control.

- There were 4 retaining sessions for the management/supervision personnel or 3 sessions in 1985 and one in 1986. The areas covered were :
  . 132 sessions in the Department of Kaolack
  . 168 sessions in the Medical Service of the Department of Nioro
  . 134 sessions in the Medical Service of the Department of Gossas
  . 104 sessions in the Medical Service of the Department of Foundiougne
  . 16 sessions in the Medical Service of the Department Kaffrine.

VI Drug Supply System and Depot management

Health Center Depots	Planned	Existing
Health Center Depots	-	9
Village Depots	9[illegible]	91

2) The documents available on the depots and on financial management are:

- order cards
- order forms or delivery orders
- inventory cards
- order book
- management record-book

3) At each depot, there is a management committee involved in the preparation of order forms in relation with the officer in charge (health post chief, PHC department supervisor).

A N N E X I I

SUMMARY REPORT, Dr. ROBERT CUSHMAN

ANNEX II

SUMMARY REPORT, Dr. ROBERT CUSHMAN

I. Introduction

April 1986 marked the mid-point in Phase II of the Rural Health Project. Building on the success of Phase I (1978-1984), USAID and the Government of Senegal agreed to continue their collaboration on the project until 1989. Specific goals for Phase II included extending primary health care services to the departments of Fatick and Kaffrine, integrating the project into the Ministry of Public Health delivery system, and introducing various programs to combat malaria, diarrhea, malnutrition, and childhood communicable diseases.

The joint Senegalese-Americans evaluation team was asked to assess the following parameters in mid-Phase II of the project:

1. the degree of extension of services to Fatick and Kaffrine,
2. the progress towards implementation of the technical components,
3. the degree of self and government financing of the project's recurrent costs,
4. the adequacy of the management information system,
5. the scope and quality of the training system; and
6. the effectiveness of the drug supply system and of the local pharmacy management.

The evaluation team worked for four weeks from April 28 to May 23, 1986. Substantial preliminary work, specifically the survey design, was done by

the Ministry of Public Health demographer, Malick Diame. The evaluation process consisted of both a survey and a review of the available documentation. Unfortunately, the workplan was overly ambitious. The majority of our time was spent conducting the survey which left little time for reviewing the documentation. Furthermore, only preliminary survey results were available when the evaluation team disbanded. As a result, the Senegalese team is to continue meeting and will submit a final report by August 1, 1986. At this point, it is important to caution the USAID Health Population, and Nutrition Office in Dakar not to make the same methodological error in future evaluations. Surveys are extremely time consuming and ideally should be conducted far enough in advance so that the results are available for verification and further study by the evaluation team.

In spite of the logistical problems, much was learned from the evaluation team's efforts and from the preliminary survey results.

The purpose of this report is to provide the team leader's summary of the evaluation work completed to date. Given that my affiliation with the evaluation process has terminated, an assessment and some recommendations are necessary at this time. Nonetheless, it is imperative that my contribution, in that it is both personal and interim, be reviewed by the Sengalese team in preparation for their final report.

II. Assesment of the Project

Nine parameters will be discussed in the assessment of the project. These parameters, which include the six terms of reference outlined for the evaluation team, are listed as follows:

1. extention to Fatick and Kaffrine,
2. integration into the Ministry of Public Health,,
3. recurrent costs,
4. PHC technical components,
5. training,
6. supervision,
7. management information systems,
8. drug supply,
9. research activities, and
10. management.

The various areas will be discussed individually in this report.

1. Extension

Over the past two years, the project has been successfully extended to the departments of Fatick and Kaffrine. The scope of the project has virtually doubled as the number of village health huts has increased from 378 to 694. Extension of the project is, without doubt, the most important accomplishment of Phase II to date. The speed and efficiency with which the extension was achieved is impressive.

There were two major factors contributing to this success. First, the project management learned from shortcomings in the implementation of Phase I Practical revisions were made in their development strategies. In particular, a great deal of attention was devoted to working with existing administrative structures. As a result, the extension of the project amounted to an impressive exercise in community development. The second major reason for the successful extension was the large demand for village health huts in Fatick and Kaffrine. It is encouraging to note the project's popularity and to see the demonstration effect Phase I had in marshalling interest in the remaining departments for Phase II.

Nonetheless, progress does not come without a price. It became clear, during our evaluation, that the project can no longer be managed in a "hands on" style from the Kaolack office. The project management, given the size and scope of activities, is now overcentralized. Not only does this impede integration of the project into the Ministry of Public Health, but it also keeps management too preoccupied with day to day business. As a result, no time or energy remains for planning and problem solving. Both of these issues - integration and management approaches - will be discussed below.

2. Integration into the Ministry Services

The Project Paper for Phase II makes it clear that a major goal is to integrate the project administration into the Minstry of Public Health's delivery system. Theoretically this goal should be quite feasible. Structurally the project is an extension of the existing system, reaching

beyond the health post to the village level. Furthermore, functions at the village health hut are supervised by Ministry personnel from the health post and health centre. Nonetheless, integration has been slow at the top levels. The project has become increasingly centralized, and a good solid working relationship has yet to be forged between the Kaolack project and regional medical offices.

3. Recurrent Costs

USAID is interested in identifying potential sources of revenue to cover recurrent costs to ensure service continues after funding terminates in 1989. To date concrete examples of possiblitities for the generation of funds are limited. Funds will have to come form the service level, from the beneficiaries of the project. The villages will have to fund the project, directly through "cotisation" or user fees, or indirectly through conseil rurale taxation revenues. There appears to be little alternative to local funding, which in itself will require political will and perhaps even some changes in legislative provisions. In the economic section of the evaluation, the financial analyst has outlined the costs for various administrative options.

The major remaining problem is the provisions of vehicles used for supervision at the departmental and regional levels. These costs are

prohibitively expensive for the local level, and yet neither the regional government nor the ministry appear interesting in absorbing the load. Therefore, it is imperative that the project management actively explore various options for both fund raising and cost cutting during the time remaining if the transition is to be successful.

The magnitude of this task should not be underestimated. It will require a change in strategy on the part of the project management.

Alternatively, the recurrent cost issue will still be at the idea stage in 1989, and the project will end with the external funding. This would be a tragedy, given the achievements of the project. It might even be worth considering a short prolongation of funding, yet at a much lower level, to promote a smoother transition to autofinancing.

4. Technical Components

As of the mid Phase II evaluation, two of the four scheduled technical components had been introduced in the pilot study area. The anti-malarial and anti-diarrhea campaigns, on the basis of preliminary survey evidence, were functioning well. In that these two programs are inexpensive, effective, and easy to administer, the recommendation is to make an effort to extend them throughout the region without further piloting.

The other two programs -immunization and nutrition- present far greater problems. To date no concrete signs of progress are visible in the pilot area. Problems are related to cost, administrative difficulties, and an effort to synchronize activities with national programs. Our understanding is that immunization is about to start in the pilot areas now that the national program has furnished the supplies for designated health posts. It is obvious that immunization in the project areas is dependent on the Ministry, and all efforts should be made to collaborate effectively with the regional medical office.

The nutrition programs warrant further study in the pilot zone. These programs are complex, and their introduction should be monitored and evaluated. Before acquiring experience and developing a prototype, it would be inadvisable to introduce the programs throughout the region.

In summary, further introduction of the primary health care technical components remains a major challenge to the project. These four basic interventions provide the core of maternal child health services, and the long range success of the project will ultimately depend on their availability.

5. Training

The scope of the projects' training program, as demonstrated by the statistics in the evaluation report, is impressive. Much of the emphasis, particularly because of the extension of the project, has been on community development work involving people at the village level. A large

degree of the project's success can be attributed to the training program. Nonetheless, mid-Phase II represents a time of change. The training centre director has recently departed for studies overseas, and this vacancy has created a vacuum which will be difficult to fill. Moreover, now that the extension is complete, major program objectives include implementation of the technical components and preparation for termination of USAID funding. Concentration on improved technical training at the poste and village level would improve the primary health care services offered. By increasing provider skills, training might also help to reduce the quantity, and thereby the cost, of supervision.

In summary, while the projects training achievements are impressive, the issues and priorities have changed, and new challenges loom between now and 1989.

6. Supervision

Supervision is viewed as the backbone of the project. The importance is reflected in job descriptions, in personnel training, and in the magnitude of the budget allocation. There remains, however, a number of problems with the quality of the field supervision.

The philosophy of supervision approaches that of an inspection or an audit. Data is collected and the forms are forwarded up the managerial hierarchy. No significant feedback is provided, either at the time of data collection or later. There also appears to be precious little supervision of professional skills during site visits.

The project's orientation towards supervision needs to be critically reviewed. The options are essentially twofold. Either the emphasis on supervision is reduced as part of the effort to curtail recurrent costs, or alternatively the quality upgraded to justify the expense. The choice may be made to scale down supervision. Perhaps it is too costly, the quality poor and the prospects for improvement limited. Interestingly, such a course of action would require a bolstering of the training program in order to develop more self-sufficiency at the post and village levels.

Alternatively to improve supervision, the role of the physicians at the circonscription medicale needs to change dramatically. The medecin-chef should perceive of himself as the team-leader, rather than as an inspector. This would require a re-orientation with substantial emphasis on management skills. In fact, given the project's over-centralization and integration problems, it would be best to decentralize rural health delivery services to the circonscription medicale level. The medecin-chef would manage services in his own area, with the regional office providing the necessary supplies and supports.

The Chef de Poste plays the pivotal role in the project system. Decentralization would involve only his immediate supervisor(s) at the Centre de Sante in day to day management. Such an organizational structure could be employed to encourage a "hands on" management style. Furthermore, the 100 - 150,000 population base provides a more practical

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administrative unit for such a basic community service. It also makes sense to organize primary care services at the level they are provided, from the Centre de Sante on down, rather than to concentrate them at the level of secondary care, the regional office.

This proposed shift in management begs the question whether the medecin chefs are capable, given the proper training, of filling this role. Clearly, quality supervision and quality management must come from this level if such a system is to succeed. Plotting such a course, however, will not be easy. Personnel at the circonscription medicale level must be targeted, trained, and supported in order to function as the system's managers. Further analysis of the problem and recommendations will come in the management section of this report.

7. Management Information System

It is clear from our review that the current management information system is an impediment to quality management. The established Ministry of Public Health reporting system at the health post level is time consuming and of little practical value. Chef de poste complain that they lack the skills to manage data, and that they never get feedback on reports sent up the hierarchy. Ironically, the presence of the project has extended the problem an additional level to the villages. The initial data forms were much too comprehensive and difficult for the village health workers to manage. Recently improvements have been made with the design of a more basic form for illiterate workers. This particular form, with some minor amendments, would better serve the entire system at the Health Hut level.

Data collection in the satellite villages is more trouble than it is worth. Data, for example, the enumeration of home diarrhea treatments, are difficult to obtain and therefore usually inaccurate. Furthermore, data collection puts an additional burden on the village workers. Satellite village activities can be adequately monitored in other ways. The turnover in chloroquine supplies is an indicator of the anti-malarial program whereas failures in the primary treatment of diarrhea will be registered at the health hut or the health poste level. Thus, there is no need to collect data at the satellite village level. We recommend that the practice be discontinued.

Data collection at the health poste presents greater problems. The current system, with all its deficiencies, is in operation nationwide, Any effort to improve the situation, therefore, must come at the Ministry level. Th recommendation is that the project management and technical assistance team work in tandem with the liason personnel in the ministry at the national and regional levels to address this problem.

8. Drug Supply

The evaluation team found that the village health hut drug supply system was working well. Interruptions in supplies in this autofinancing system were uncommon. This achievement represents a dramatic change from the early days of the project. Nonetheless, efforts must be made at the

Ministry level to activate the Regional Pharmacy. Alternatively, shortages in the Ministry supply system could well lead to a divergense of drugs from the village supply.

9. Research

The Phase II project paper outlined an ambitious research program, and yet at mid-Phase little has been accomplished.

The problem is multi-dimensional. First, the scope of intended activities was both overly ambitious and impractical. The project, given the poor community data base and the superficial level of service, should steer clear of epidemiological research. For example, the vaccine coverage rate is less than 10% for children under five in the Project area.[1] This clearly indicates that research should address ways of improving coverage -comparing the effectiveness of various delivery modalities- rather than looking at disease control or vaccine failures. In short, project research should be little more than systematic problem solving.

The second facet of the problem involves technical assistance. It appears, from reading the project paper, that the technical assistance team was intended to orchestrate research activities. Such has not been the case. While the team has been on site for less than a year, it is clear that the same old problems persist. The team lacks direction, and has not been well integrated into project activities.[2] This points to the third and major reason for the lack of achievement in research, namely the

[1] The 10% figure is based on preliminary survey results from the village and health post levels and talks with Ministry of Public Health officials.

[2] The above may slight changes being considered in terms of the implementation of the research component. The Host Government contract with Harvard specifies that the technical assistance team will "advise on the development of an applied research program." USAID reports that the contract language reflects present intent related to operations research more accurately than does the Project Paper language.

lack of management leadership. The project needs a strong management team to identify applied research priorities and to coordinate the technical assistance.

It is encouraging to note that a revised research program, more realistic in scope and practical in application, has recently been outlined by the project. This is a solid first step, and now needs to be complimented by efforts to provide the management leadership necessary to implement the program.

10. Management

A constant theme throughout this report is the projects' lack of an effective management team. Currently Ida La Faye single handedly runs the project from the Kaolack office. It is in many ways thanks to her dedication and dynamism that the project has been so successful.

Nonetheless, the project has become too large for a single line manager to administer. Rapid growth has created an overcentralized system. The project coordinator is preoccupied with day to day tasks, and working relationships with personnel in Dakar and in the Regional Medical Office are fragmented. The result is that planning issues and problem solving receive inadequate attention. Basic administrative duties need to be decentralized, preferably to the circonscription medical level, and an effective management team must be forged. Members of such a team must include personnel from the project office, the regional medical office, the technical assistance team, the USAID office in Dakar, and the National

Ministry of Public Health. The formation and nature of such a team must be the project's top priority if the work at hand is to be accomplished.

The problem is compounded by long-term overseas training. Two of the three principal parties in Kaolack, the regional medical officer and the project training director, recently left for long-term training in the United States. The project director is also scheduled to leave in a year's time. The overseas training policy is eviserating the project's senior management ranks. While overseas training is important, a more gradual approach would serve the project better. In the meantime, possibilities for further in-country training should be explored.

III Summary

In the foregoing discussion, the various parameters considered by the evaluation team have been reviewed. I have attempted to synthesize what we have learned to date and to make some recommendations for the duration of Phase II.

In conclusion, the achievements of the project are impressive. The Sine Saloum is now covered by approximately 700 health huts. Primary health care is now widely available, and generally accessible to 1.3 million people. The project was able to double its coverage in the past two years. Hundreds of people have been trained and new technical components have been introduced in pilot areas. Necessary drugs are readily available at the village level and efforts at autofinancing are being explored.

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Perhaps the greatest testimonial to the success of the program comes from village mothers who told us what a difference the health hut, with its personnel and supplies, had made in their lives.

Nonetheless, the success of the program has created new problems and different structural needs. A program as large as the Sine Saloum Rural Health Delivery Services Project can no longer be run by a single person in a line management style. Day to day administration of the project must be decentralized and a senior management team forged so that new problems and priorities can be addressed in a cohesive and skillful manner. Formation of a management team is the projects's major challenge. Only in such a way can basic issues such as management information systems, recurrent costs, supervision, applied research, and the introduction of technical components be addressed. The USAID office in Dakar might do well to consider recruiting external technical assistance in management training to help in their efforts.

At this point, I wish to thank all of those who helped with the evaluation. A large number of people, on the evaluation team, in the Ministry, and with the project, gave the energy and cooperation necessary to complete our enormous task.

Robert Cushman

A N N E X I I I

EVALUATION SURVEY QUESTIONNAIRES

ANNEX III

EVALUATION SURVEY QUESTIONNAIRES

QUESTIONNAIRE

AUTORITES SANITAIRES

Région de _____ Enquêteur _____

Département de _____ Date _____

Arrondissement de _____

Identification

Nom _____

Titre _____ depuis quand _____

Date d'arrivée dans la localité _____

1. Quand avez-vous été informé du projet?

   Année _____

2. Comment avez-vous été informé du projet?

   _____

   _____

   _____

3. Comment avez-vous été impliqué lors de l'implantation du projet dans votre localité?

4. A l'ouverture de combien de cases avez-vous participé?

_____ cases

5. Comment avez-vous été impliqué dans le déroulementt du projet?

- décisions / interventions:

6. Quels moyens de supervision utilisez-vous dans votre circonscription médicale?

6.1 Quelles sont leur provenance?

Etat _____

Projet _____

Autres _____

6.2 Qui assure leur entretien?

_____

6.3 A combien estimez-vous les frais d'entretien par semestre?

_____

6.4 Qui assure la dotation en carburant?

_____

6.5 Combien de litres d'essence recevez-vous comme dotation mensuelle?

_____

6.6 Pour la suite du projet, quelle(s) solution(s) entrevoyez-vous pour la prise en charge des moyens de supervision

- Moyens logistiques _____
- Carburant _____
- Pièces de rechange et entretien _____

6.7 Avez-vous relevé des signes pour cette prise en charge?

Oui (___) Non (___)

Si oui, lesquelles ? _____

_____

_____

7. Que pensez-vous du projet?

Avantages _____

_____

_____

Inconvénients _____

_____

_____

8. Avez-vous des suggestions pour un bon déroulement du projet dans votre localité?

_____

_____

_____

_____

_____

_____

9. Avez-vous des suggestions pour l'après-projet notamment en ce qui concerne les charges récurrentes?

_____

_____

_____

_____

_____

_____

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QUESTIONNAIRE "COMITE"

Poste de _____ Enquêteur _____
Case de _____ Date _____
Village de _____ Début de l'interview _____
Fin de l'interview _____
(mettre l'heure)

1. Dresser la liste des membres du comité :

No.	Prénom	Nom	Poste dans le Comité	Profession	Fonction dans la localité	Mode de Sélection	Date de Format°	Présence P ou A
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								

2. Date de mise en place du comite : /_____/_____/
mois année

2.1 Nombre de réunions tenues depuis la mise en place du comité _____

3. Quels sont les sujets abordés pendant ces réunions:

1 _____

2 _____

3 _____

4 _____

5 _____

4. Demander les décisions prises, leurs réalisations ou non et raison non réalisation.

	Décisions	Réalisation		Si non Réalisé, pourquoi ?
		Oui	Non	
1.				
2.				
3.				
4				
5.				
6				

5. Médicaments

5.1 Difficultés rencontrées pour réapprovisionnement ?

- Disponibilité au lieu d'achat : Oui ___ Non ___

- Coût transport : Oui ___ Non ___

- Autre (à préciser) _____

5.2 Demander à voir le cahier de stock avec les bons de commande :

Cahier Vu _____ Non vu _____

bons de commande vus _____ Non vus _____

5.3 Si vu, remplir le tableau ci-dessous.

Produits	Situation à la date de départ / / mois année	Date des commandes — Quantité commandée selon la date						Quantités périmées	Stock actuel
Aspirine									
Chloroquine									
Fer									
Terpine Codéine									
Charbon									
Parégorique									
Pipérasine									
Auréomycine 1 %									
Auréomycine 3%									

Nombre d'inventaires depuis avril 1985 : _____

Si non mensuelle, pourquoi ? _____

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6. Gestion

6.1 Tenez-vous un cahier ? Oui /___/ Non /___/
si non passer à 6.4 seulement

6.2 Si oui, demander à voir le cahier :

Standard /___/ Non standard /___/

6.3 Comment tenez-vous le cahier :

Mensuellement /___/

Après chaque commande /___/

Autre /___/

6.4 Est-ce que vous faites le contrôle des finances ?

Oui /___/ Non /___/

Si oui, comment le faites-vous ?

6.5 Comment sont généralement faits les contrôles ?
(voir le cahier)

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6.6 Gestion

Remplir le tableau (résumé du contenu du cahier de gestion)

Exploitable / Oui / Non /

Mois	Recettes		Dépenses					Disponible	
	Cotisation	Paiement	Médicaments	Personnel	Entretien Mobylettes C.J	Autre Entretien	Autre	En caisse	Banque
Avril 85									
Mai 85									
Juin 85									
Juillet 85									
Août 85									
Sept. 85									
Oct. 85									
Nov. 85									
Déc. 85									
Jan. 86									
Fév. 86									
Mars 86									
Avril 86									

Observations de la case

Case de _____ Sale / / ou propre / /

Remplir le tableau suivant pendant votre visite à la case.

Etat infrastructure

Appréciations/ Désignation	Bon	Passable	Mauvais
Murs			
Toiture			
Fermetures			

- Dans la case correspondante à votre appréciation :
  - sur les murs : noter tiges de mil, banco, ciment selon la cas.
  - sur la toiture : paille, zinc, autres.
  - sur les fermetures : tige de mil, bois, zinc.

Matériel de la case

Code	Désignation	Standard	Existant Nbre	Existant Etat	Lieu de Gardiennage	Situation de départ
11	Armoire	1				
12	Table de pansement	1				
13	Table de travail	1				
14	Tabourets	2				
15	Bancs	2				
21	Haricot P.M.	1				
22	Boite métal. moyenne	1				
23	Pince cocher	2				
24	Paire de ciseaux					
	Droits 15cm					
	Autre					
	Ensemble	12				

Retourner à la première page pour noter l'heure de la fin de l'interview.

QUESTIONNAIRE "MEMBRES DE COMITE"

Poste de _____ Enquêteur _____

Case de _____ Date _____

Village de _____ Début enquête
Fin enquête

Membre : .....
Prénom et nom : .....
Village de résidence : .....
Age : ..... Sexe : .....

1. Pouvez-vous donner une description de la nouvelle politique (de SSP) ?

1.1 Si aucune réponse, demandez spécifiquement :

1) Rapprochement des services de santé :
Oui /___/ Non /___/
2) Responsabilisation des populations en matière de santé :
Oui /___/ /___/

2. Dans cette nouvelle politique, le comité que vous constituez est d'une importance capitale, alors pouvez-vous nous dire brièvement :

2.1. Sa composition :
- Président ☐ - Trésorier ☐ - Commissaire au Compte ☐
- Comité des mères - Comité des jeunes - Comité d'assainissement ☐

2.2 Ses tâches au niveau de la case :

3. Pouvez-vous nous décrire la manière dont vous procédez pour vous approvisionner en médicaments :

   -

   -

   - Ne sait pas

4. Avez-vous eu des ruptures de stock ?

   Oui /___/ Non /___/ Ne sait pas /___/

   Si oui, pourquoi ?

   Pour quel(s) produit(s) ?

5. Comment sont fixés les prix au niveau de la case ?

   -

   -

   - Ne sait pas

6. Comme vous le savez, vous disposez d'un dépôt communautaire, pouvez-vous nous dire le rôle du comité au niveau de ce dépôt ?

   - Ne sait pas

   -

   -

7. Quels sont les avantages apportés par la case ?

   - Ne sait pas.

   -

   -

8. Avez-vous relevé des inconvénients ?

-

-

-

9. Quels sont vos préoccupations en matière de santé ?

-

-

-

-

10. Les ASC mènent un certain nombre d'activités au niveau de votre localité.

10.1 Pouvez-vous les citer ?

-

-

-

10.2 Quels autres activités souhaiteriez-vous qu'ils mènent par rapport à vos préoccupations ?

-

-

-

-

Retourner à la première page pour noter l'heure de fin de l'enquête

QUESTIONNAIRE AGENT SANTE COMMUNAUTAIRE (ASC)

Poste de _____ Enquêteur _____

Case de _____ Date _____

Début de l'interview _____ Fin de l'interview _____

Identification

Nom _____ Age _____ Sexe _____

10. Formation de base:

Secouriste - hygièniste (__)

Matrone (__)

11. Où est-ce que vous avez été formé?

Poste de Santé _____

Centre Médical _____

Autre _____

12. Année de formation _____

13. Durée de formation _____

14. Avez-vous commencé vos activités dès la fin de votre formation?

Oui _____

Non _____

14.1 Si non, combien de temps avez-vous attendu? _____ mois

14.2 La durée de ces activités
Calcul par l'enquêteur

(____) ans (____) mois

15. Recyclage de la formation de base

Sujet	Nombre(s)	Date(s)
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

16. Volets Techniques

(Pour les zones tests, continuer, mais pour les zones d'extension, passer au point 20 et suite)

16.1 RVO (Diarrhée)

Mois Année

Formation (___) Période (_____) (_____) par qui _____

Recyclage (___) Période (_____) (_____) par qui _____

16.2 PEV (Vaccination

Mois Année

Formation (___) Période (_____) (_____) par qui _____

Recyclage (___) Période (_____) (_____) par qui _____

16.3 Croissance/Nutrition

Mois Année

Formation (___) Période (_____) (_____) par qui _____

Recyclage (___) Période (_____) (_____) par qui _____

16.4 Anti-paludisme

Mois Année

Formation (___) Période (_____) (_____) par qui _____

Recyclage (___) Période (_____) (_____) par qui _____

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2.3.1 Les activités que vous menez recouvrent-elles les principales préoccupations de votre localité en matière de santé?

Oui (___) Non (___)

2.3.2 Si non, que souhaiteriez-vous faire d'autre?

2.4. Les malades trouvent-ils tous les médicaments dont ils ont besoin dans la case pour les premiers soins?

Oui (___) Non (____)

2.4.1 Si non, que souhaiteraient-ils comme autres médicaments?:

_____

_____

_____

2.4.2 Avez-vous eu des ruptures de stock

Oui (____) Non (____)

Pour quels médicaments _____

_____

2.5 Combien de villages dépendent de votre case? _____

2.5.1 Combien de villages fréquentent votre case? _____

2.6 Vous arrive-t-il de vous rendre dans les villages polarisés (dépendants) par votre case?

Oui (____) Non (____)

2.6.1 Si non, pourquoi? (Notez les raisons invoquées par l'ASC)

2.6.2 Si oui (à 26), par quel moyen? _____

2.6.3 Si oui, (à 26) pour rendre quels genres de service?
(Notez les services déclarés)

3.0 Occupations et motivations

3.1 Quelle était votre activité principale avant l'implantation de la case?

3.2 Quelle est votre principale activité actuellement à part le travail de la case?

3.3 Vos activités à la case gênent-elles vos activités normales?

3.3.1 Avez-vous des heures fixes d'ouverture de la case?

- pendant l'hivernage _____

- pendant la saison sèche _____

3.4 Que recevez-vous en échange comme motivation?

3.4.1 Si rien (à 3.4), que vous a-t-on promis comme motivation?

4.0 Supervision

4.1 Combien de fois avez-vous été supervisé (durant les 6 derniers mois)?

_____

4.2 Que fait le superviseur lors de ces visites de supervision?

5.0 Collecte des données
(voir les rapports)

5.1 Notez les chiffres concernant les différents faits sanitaires au niveau de la case. (Depuis le début de 1986)

Consultations _____

Décès _____

Naissances _____

Accouchement dans le village _____

5.2 Avez-vous transféré des malades vers le poste de santé (depuis le début de 1986)?

Oui (____) Non (____)

5.2.1 Si oui combien _____

pour quelle raison _____

_____

Combien de ces malades avez-vous revu après leur traitement au poste?

_____

5.2.2 Si non, pourquoi selon vous ? _____ _____

_____

6.0 <u>Prévalence du paludisme et de la diarrhée durant la dernière campagne</u>

6.1 Nombre de cas de paludisme _____

6.2 Nombre de cas de diarrhée _____

6.3 Nombre de cas de diarrhée traités par RVO _____

Fin de l'interview pour les zones d'extension
Passez à la première page pour noter l'heure de la fin de l'interview.

7.0 <u>Connaissance des volets techniques (pour les zones-test seulement)</u>

7.1 Décrivez votre rôle dans le programme de lutte anti-palustre:

7.2 Donnez les différentes doses par groupe cible:
(Notez les déclarations de l'ASC)

- Chimioprophylaxie:

- Enfant 0-11 mois _____ comprimés/semaine
- " 1- 2 ans _____ " "
- " 3- 4 ans _____ " "

- Chimio-thérapie:

- Enfant 0-11 mois _____ comprimés/semaine
- " 1- 2 ans _____ " "
- " 3- 4 ans _____ " "

7.3 Décrivez votre rôle dans le programme RVO:

7.3.1 Donnez la composition de la solution RVO:

Composantes	Quantités
_____	_____
_____	_____
_____	_____
_____	_____

7.2.2 Décrivez la méthode d'administration:

Passez à la première page pour noter l'heure de la fin de l'interview.

QUESTIONNAIRE ANIMATRICE

Poste de _____ Enquêteur _____

Case de _____ Date _____

Village de _____

Début interview _____ Fin interview _____

Identification

Nom _____ Age _____

10. Formation de base:

11. Où est-ce que vous avez été formé?

Case: _____

Poste de santé: _____

12. Année de formation _____

13. Durée de formation _____

14. Avez-vous commencé vos activités dès la fin de votre formation?

Oui (___) Non (___)

14.1 Si non, combien de temps avez-vous attendu? _____ mois

14.2 La durée de ses activités - calcul par l'enquêteur:

(_____) ans (_____) mois

15. Recyclage (volets techniques)

15.0 Avez-vous été recyclée pour?

		Recyclage	Nombre de fois	Durée totale	Par qui
15.1	RVO (Diarrhée)	(___)	(_____)	_____	_____
15.2	Anti-paludisme	(___)	(_____)	_____	_____

20. Activités

21. Quelles sont les activités que vous devez mener au sein de votre localité?

_____

_____

22. Après votre formation aviez-vous rencontré des difficultés pour mener vos activités?

Oui (___) Non (___)

Si non, passez à 23.

22.1 Si oui, lesquelles? _____

_____

_____

22.2 Avez-vous résolu ces difficultés? Oui (___) Non (___)

22.3 Si non, pourquoi? _____

_____

23. Sensibilisation des populations

23.1 Les femmes connaissent-elles votre rôle dans le cadre de la lutte anti-palustre et de la RVO?

Oui (___) Non (___)

Si non, passez à 23.3

23.2 Si oui, comment ont-elles été informées de votre rôle?
(ne pas suggérer les réponses)

- (___) Radio
- (___) Réunion comité de santé
- (___) Comité des mamans
- (___) Porte à porte
- (___) Réunion avec chef de Poste
- (___) Autres (à préciser)

23.3 Avez-vous formé les mères après votre propre formation?

Oui (___) Non (___) si non, passez à 24.

Nombre de séances tenues _____

Nombre de mères formées (au total) _____

23.4 Avez-vous été assisté pendant ces séances

Oui (___) Non (___) Si oui, par qui? _____

24. Comment a été assurée votre première dotation en chloroquine?

_____

24.1 A combien s'élevaient vos recettes au cours de la campagne passée?

_____

24.2 Avez-vous eu des ruptures de stock?

Oui (___) Non (___)

24.3 Si oui, pourquoi? _____

25. Vous arrive-t-il de vous rendre dans les concessions de votre village? (dans le cadre de vos activités)

Oui (___) Non (___)

25.1 Si oui (25) pour rendre quels genres de service? (notez les services déclarés)

_____

_____

25.2 Comment organisez-vous la distribution des services:

(___) Domicile (chez vous)

(___) Arbre à palabres

(___) Porte à porte

Occupations et motivations

26. Quels sont vos jours de rendez-vous durant la campagne de chloroquinisation?

_____

27. Combien d'heures êtes-vous disponible le(s) jour(s) de rendez-vous?

_____

28. Supervision

28.1 Combien de fois avez-vous été supervisé (durant la campagne précédente)?

_____

Si jamais supervisée, passez à 40.

29. Par qui? _____

30. Que fait le superviseur lors de ces visites de supervision?

_____

30.1 Que pensez-vous de la supervision?

_____

Collecte des données (voir rapports mensuels)

Si elle n'a pas de rapport, passez à 41.

40. Recueillir les données pour 1985

Chimioprophylaxie - enfant 0-5 ans _____

- femme enceinte _____

Diarrhée - nombre de mères qui viennent demander conseil _____

40.1 Le nombre de cas de diarrhée pour la même période:

_____

40.2 Le nombre de fois que la RVO a été effectuée dans votre localité:

_____

41. Avez-vous transféré des malades vers la case de santé?

Oui (___) Non (___)

42. Avez-vous transféré des malades vers le poste de santé?

Oui (___) Non (___)

42.1 Si oui (pendant les 3 derniers mois):

	case	Poste
combien	_____	_____

pour quelle raison _____

_____

42.2 Si non, pourquoi selon vous? _____

_____

43. Combien de ces malades avez vous revu après leur traitement au poste ou à la case?

50. Connaissance des Programmes

51. Décrivez votre rôle dans le programme de lutte anti-palustre:

51.1 Donnez les différentes doses par groupe cible:
(notez les déclarations de l'animatrice).

- Chimioprophylaxie:

- Enfant 0-11 mois _____ comprimés/semaine
- " 1- 2 ans _____ " "
- " 3- 4 ans _____ " "
- Femme enceinte _____ " "

Collecte des données Palu

51.2 Comment enregistrez-vous:

les inscrits _____

les prises de chloroquine _____

52. Décrivez votre rôle dans le programme RVO:

_____

_____

_____

52.1 Donnez la composition de la solution RVO:

Composantes	Quantités
_____	_____
_____	_____
_____	_____
_____	_____

52.2 Décrivez la méthode d'administration de la RVO:

52.3 Utilité de la RVO:

52.4 Collecte des données RVO:

Comment enregistrer-vous:

les cas de diarrhée _____

l'utilisation de la RVC _____

Retournez à la première page pour noter l'heure de fin de l'interview.

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I N S T R U C T I O N S "QUESTIONNAIRES MERES"

IDENTIFICATION

Dès que vous arrivez dans le village vous devrez procéder de façon suivante :

* Mettre le nom du poste de santé, de la case de santé, du village siège ou polarisé, la date et l'heure du début d'enquête et votre nom.

* Demander le nom du Chef de carré, de l'enquête, l'âge et l'état matrimonial de l'enquêtée
  NB : un carré peut comprendre plusieurs ménages.
  Etat matrimonial : l'enquêtée peut être mariée, célibataire ou veuve.

* Noter le nombre d'enfants (0.5) qui sont sous sa tutelle, vivants ou décédés (xaley yinga yoor)
  durant la campagne suivre l'établissement des numéros d'ordre quant à leur intervention au cours de l'enquête - Insistez surtout sur l'âge de l'enfant.

MALADIES - CIBLES DES PROGRAMMES

1 - Se rappeler toujours de la période "(hivernage passé" qui est un point de référence très important.)
  Paludisme = Siburu, Rougeole = Ngass
  Coqueluche = Ndiambataan ou Xouret
  Tétanos = Diad
  Pour le remplissage, mettre à l'intérieur des boucles le nombre de cas (nombre de fois).
  NB : Pour les évacuations, se rappeler que seule une compétence peut le faire à partir d'un point de référence : c'est à dire :
  malade (mère ou enfant) ——> /case de santé/ ——> Evaluation / Poste santé

2. VACCINATION (Niaku)

* Mère (pingu ou niaku djiguène bu werul) cocher les cases correspondantes.

Avez-vous reçu une carte de Vaccination ?

- Si oui et elle vous montre la carte : mettre V dans la boucle
  et elle ne vous montre pas la carte : mettre NV dans la boucle
- Si non mettre une croix dans la case correspondante.

* Enfant : les enfants sont-ils vaccinés ? Cocher la case correspondante.

Si oui réclamer les cartes de vaccinations remplir les observations suivantes.
Si non passer à la question suivante en insistant sur le lieu de vaccination
NB = le nombre de passage correspond aux vaccinations subies selon le libellé de la question précédente. Le lieu de vaccination est très important

'ROGRAMME DE LUTTE ANTI PALLUDIQUE

1.1 Mettre une croix à la case correspondante

1.2 IDEM

1.3 IDEM

2 - Cocher la case correspondante et n'oublier pas de noter la périodicité.

3 - Cocher la case correspondante

4.1 IDEM

4.2 IDEM

./.

4.3 Si l'enquêtée donne comme raison le coût des comprimés, cocher la case de la question 5 sinon posez la question 5

6. Relever le nombre de comprimés que l'enquêtée aura à donner pour la prévention pour chaque groupe cible et quelle que soit la quantité.

7. Cocher la case correspondante. L'essentiel est qu'il y est un prélèvement sinon passer à la question passer à la question 8.

7.1 Mettre une croix à la case corrrespondante

7.2 IDEM

8. 2 cas se présentent :

les réponses spontanées et les réponses guidées.

cocher la case correspondante selon la réponse de l'interviewée

8.1 Critique = Guis Guis suggestion = xelel

. PROGRAMME RVO

- cocher la case correspondante tout en se référant aux numéros d'ordre des enfants de moins de 5 ans listés aux chapîtres portant sur l'identification. la période demeure important.

1. Cocher directement la RVO si elle cite la composition du mélange eau - sel - sucre. Lister ci-dessus les méthodes auxquelles elle a eu à recouvrir.

1.2 Cocher la case correspondante

NB = si elle ne connaît pas la RVO, retourner à la 1ere page pour noter l'heure de fin de l'interview.

./.

2. Mettre une croix à la case correspondante; préciser les autres sources si elles existent.

3. Demander à l'enquêtée comment elle prépare et relever tout juste ses déclarations pour l'administration IDEM.

4. Mettre une croix devant la ou les réponses fournies par l'enquêtée, surtout ne pas suggérer des réponses.

5. Mettre une croix devant la cage correspondante

5.1 IDEM - N'oublier pas de préciser la case "autres" -

6. Se conformer aux instructions figurant sur le questionnaire.

7. Si l'enquêtée n'a pas de problème dans la pratique de la RVO, mettre une croix dans la case "aucun" . Sinon cocher la ou les cases des rubriques ci-dessous listées.

8. Noter les mesures d'hygiène citées par l'enquêtée.
Ne pas oublier de retourner à la première page pour mentionner l'heure de fin de l'interview.

QUESTIONNAIRE MERES

PS de _____ Date _____

Case de _____ Début _____

Village de _____ Fin _____

Enquêteur _____

Identification

Chef de carré _____

Nom de l'enquêtée _____

Age _____

Etat matrimonial

Nombre d'enfants 0-5 ans _____

	Prénom	Nom	Sexe	Age
1				
2				
3				
4				
5				

I. MALADIES - CIBLES DES PROGRAMMES

1. Au cours de l'hivernage passé, avez-vous relevé des cas de :
(en ce qui vous concerne vous et vos enfants de moins de 5 ans)

Nombre de cas

	Mère	Enfants	Evacuation	Guérison	Décès
- Paludisme	(___)		(___)	(___)	(___)
- Paludisme		(___)	(___)	(___)	(___)
- Diarrhée		(___)	(___)	(___)	(___)
- Rougeole		(___)	(___)	(___)	(___)
- Coqueluche		(___)	(___)	(___)	(___)
- Tétanos		(___)	(___)	(___)	(___)

2. Vaccinations

2.1 Mère:

durant la grossesse - (VAT) tétanos (0) (1) (2)

Avez-vous reçu une carte de vaccination Oui (___) Non (___)

2.2 Enfants

a) Sont-ils vaccinés Oui (___) Non (___)

b) Si oui ont-ils des cartes de vaccination?

Oui (___) Non (___)

Si oui, remplir les observations ci-dessous

Enfant	1	BCG	(___)	DTCP	(___)	R/FJ	(___)
Enfant	2	BCG	(___)	DTCP	(___)	R/FJ	(___)
Enfant	3	BCG	(___)	DTCP	(___)	R/FJ	(___)
Enfant	4	BCG	(___)	DTCP	(___)	R/FJ	(___)
Enfant	5	BCG	(___)	DTCP	(___)	R/FJ	(___)

Si non, demandez les renseignements suivants:

		Nombre de passages	Où
Enfant	1	_____	_____
Enfant	2	_____	_____
Enfant	3	_____	_____
Enfant	4	_____	_____
Enfant	5	_____	_____

II. PROGRAMME DE LUTTE ANTI PALUDIQUE

1 Avez-vous eu à vous prévenir du paludisme l'hivernage passé avec de la chloroquine (perr)?

1.1 Vous? Oui (___) Non (___)

Si oui: raison (grossesse (___) autre (___)

1.2 Vos enfants? Oui (___) Non (___)

1.3 (si non à 1.1 et 1.2, passer à 5)

(si oui à 1.1 ou 1.2, continuer l'interview)

2 Où vous approvisionnez-vous en chloroquine?

Animatrice Oui (___) Non (___)

ASC Oui (___) Non (___)

Autre à préciser _____

Si oui: périodicité _____

(si l'approvisionnement se fait chez l'animatrice, continuer l'interview)
Si autre, passer à 4

3 L'animatrice a-t-elle été toujours disponible pendant les périodes d'approvisionnement?

Oui (___) Non (___)

4 Les prises de chloroquine ont-elles été régulières?

4.1 Pour vous? Oui (___) Non (___)

4.2 Pour vos enfants? Oui (___) Non (___)

4.3 Si non pourquoi?

Goût désagréable? (___)

Autre à préciser _____

Si enquêtée donne comme raison le coût des comprimés, cocher oui à la question 5.

Si pas de référence au coût, poser la question 5.

5 Avez-vous été limitée par le coût des comprimés?

Oui (___) Non (___)

6 Pouvez-vous donner les doses par groupe-cible?
(poser la question par rapport à chaque groupe-cible en le citant)

enfant 0-11 mois ..... comprimé (s) par semaine
enfant 1- 2 ans ..... comprimé (s) par semaine
enfant 3- 4 ans ..... comprimé (s) par semaine
femme enceinte ..... comprimé (s) par semaine

7 Vous a-t-on prélevé du sang (vous ou vos enfants)

Oui (___) Non (___)

(si oui, continuer l'interview

si non passer au 8

7.1 Avez-vous compris les raisons de ces prlèvements

Oui (___) Non (___)

7.2 Avez-vous été informés des résultats des analyses des gouttes de sang prélevées?

Oui (___) Non (___)

8 Quelles sont les autres moyens que vous avez pour la lutte anti-paludique dans votre village?

Attendre la réponse spontanée de l'enquêtée, si pas de réponse, guider la réponse

	Réponse spontanée	Réponse guidée
Moustiquaire	(___)	(___)
Insecticide autour des maisons	(___)	(___)
Elimination des gites de larvaires	(___)	(___)
Desherbage	(___)	(___)

Autre (à préciser) _____

8.1 Quelles sont les suggestions et critiques sur l'application du programme de lutte anti-paludique dans votre village?

_____

_____

_____

_____

III. PROGRAMME RVO

Vos enfants ont-ils eu la diarrhée durant ces 3 derniers mois

enfant 1 Oui (___) Non (___)
enfant 2 Oui (___) Non (___)
enfant 3 Oui (___) Non (___)
enfant 4 Oui (___) Non (___)
enfant 5 Oui (___) Non (___)

9 Que faites-vous habituellement pour prévenir les conséquences de la diarrhée chez vos enfants?

_____

_____

_____

Connaissance de la RVO Oui (___) Non (___)

9.1 Comment avez-vous traité votre enfant la dernière fois qu'il avait la diarrhée?

_____

_____

_____

9.2 Continuez-vous à nourrir votre enfant pendant la diarrhée

Oui (___) Non (___)

Fin interview pour les femmes qui ne connaissent pas la RVO. Retourner à la première page pour noter l'heure de la fin de l'interview.

==========

10 Comment avez vous appris l'utilisation de la RVO?

- à partir d'une simple information?

Oui (___) Non (___) source(s) radio Oui (___) Non (___)

-autres _____

- à partir d'une démonstration?

Oui (___) Non (___) par qui? _____

- Autres à préciser _____

11 Décrivez le procédé

- pour la préparation de la solution?

composantes?	Quantités
_____	_____
_____	_____
_____	_____
_____	_____

- pour l'administration de la solution?

+ Quantité _____à quel moment?_____

+ Pendant combien de temps pour une amélioration éventuelle? _____

+ Que faut-il faire si à la limite l'état ne s'améliore pas?

_____

_____

_____

_____

12 Quels avantages présente la RVO?
(ne pas suggérer les réponses. Mettre une croix devant la ou les réponses fournies par l'enquêtée)

( ) pas de réponse

(___) arrêter la diarrhée

(___) lutte contre la deshydratation

(___) apporte de l'énergie

(___) autre (à préciser)_____

_____

13 Face au(x) cas de diarrhée, avez-vous toujours utilisé la RVO?

Oui (___) Non (___)

13.1 Si non, pourquoi?

(___) pas l'occasion

(___) autres à préciser _____

14 Pouvez-vous nous dire le nombre de fois que vous avez utilisé la solution RVO (si le nombre de cas déclaré est égal à 1 (un), mettre 1 à nombre de préparation et passer au point 15).

- nombre de fois _____ (si la réponse est "pour tous les cas déclarés", noter le nombre de cas déclarés comme nombre de fois)

- au moins _____ fois (dans le cas où elle ne se rappellera pas du nombre exact).

15 Rencontrez vous des problèmes dans la pratique de la RVO?

Aucun ( )

Financier ..... Oui ( ) Non ( )

Disponibilité en sucre ..... Oui ( ) Non ( )

Disponibilité en eau..... Oui ( ) Non ( )

Disponibilité en sel ..... Oui ( ) Non ( )

Disponibilité bois de chauffe..... Oui ( ) Non ( )

16 Que devez-vous faire pour prévenir votre enfant contre la diarrhée? (noter les mesures d'hygiène citées par l'enquêtée)

_____

_____

_____

Retourner à la première page pour noter l'heure de fir de l'interview.

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0679H/JS

A N N E X I V

M.I.S. : "THE KELLY REPORT"

A N N E X I V

M.I.S. : "THE KELLY REPORT"

REPORT FOR PHASE II OF THE SINE-SALOUM PHC PROJECT

MANAGEMENT INFORMATION SYSTEM-PAST AND FUTURE

THE ROLE OF COMPUTER TECHOLOGY

POSSIBILITIES FOR APPLIED RESEARCH

By Patrick Kelly
December, 1983

TABLE OF CONTENTS

I. INTRODUCTION

A. Look at the calendar

In 1978, the World Health Organization chose the year 2000 as the target date for a dramatic objective: Health for All. Now less than 6000 days away from Saturday, 1 January 2000, and in spite of tremendous efforts to implement primary health care, it is not at all clear that progress is being made towards that goal.

B. Listen to the debate

1. Progress towards preserving the lives of our children is now actually slowing down. (1)

2. We have the potential for a revolutionary improvement in the well-being of children that is as momentous for the children in the decade ahead as was the Green Revolution for increasing grain production. (2)

3. We endorse the concept of primary health care and contend that there is no valid reason to question "Health for All by the Year 2000" as a feasible goal. (3)

4. In many instances, primary health care is not adapted to the needs of the people. (4)

5. There is a risk in trying to reach that goal in ways that become so standardized, so impersonal, so controlled by those in power, that many of the human qualities essential to health-and to health care-are lost. (5)

6. Negative impatience is looming on the horizon. I am all for impatience if it leads to better and speedier action along collectively agreed lines. But I am against it if it imposes fragmented action from above. (6)

C. Examine the hypotheses

Recommendations for the improvement of PHC fall into three major philosophical categories:

1. Better program design, management and implementation.

a. Much greater attention must now be directed at improving the management of health programs and devising programs that can be self-financing over the long term. (7)

b. There is a need to demystify and simplify the managerial process for national health development. In spite of attempts to do so in this document, the process remains complex. (8)

c. The objective of the recent WHO conference in Bamako was to enable the participants to understand the meaning of PHC management. (9)

2. Community supportive programs

Community participation is more than just financial support. Supportive programs encourage responsibility, initiative, decision-making and self-reliance at the community level. (10)

3. Modern technology

We believe that if there is to be hope of approaching that target, that the best of modern technology will have to be employed. (11)

D. Accept the challenge

In the final analysis, PHC is a combination of political will, technical implementation and community responsibility. Although there is much disagreement as to which approaches are best, there is also much agreement. Do we not in fact agree that:

1. There is no one right or magic formula.

2. No strategy will be without errors.

3. The goal is worth the effort.

4. We can do much better.

Paradoxically, we health professionals have ourselves been part of the problem in that we have proposed and implemented actions which have been too ambitious, complex and costly. Now we have learned that to have a big impact we must start small, to achieve rapid results we must proceed slowly and to solve complex problems, we must use simplified methods.

II. MANAGEMENT INFORMATION SYSTEM

A. Definition

The theory of management in primary health care goes as follows:

1. PHC requires a national strategy.
2. The strategy must be implemented.
3. Implementation requires rational decision-making (management).
4. Management requires information.
5. Information requires data analysis.
6. The data must be reliable and valid.

Thus a MIS can be defined as systematic data generation, analysis and communication of results which permit ongoing evaluation and rational decision-making. Unfortunately such an ideal is rarely seen in practice.

"Decision-making for health development is rarely based on rational criteria or information feedback. It is governed by vested interests, prejudice, outcomes of power struggles, culture of bureaucracies and preconceived assumptions about interventions particularly of the technico-medical kind." (12)

III. MIS-PHASE I

The one work that best describes it is "HEAVY". People are in agreement from the village to the national level regarding the following points:

1. There are too man forms.
2. They are too complicated.
3. The system is parallel to the national one.
4. Instructions and training concerning use of the forms have not been adequate.
5. Supplies of printed forms sometimes run out.
6. Collection of reports have been irregular.
7. Few analyses have been done.
8. No feedback of results has occurred.
9. When special studies are done, the results are often long in coming.

In other words, already overworked people see the reporting system as an added burden that to date has provided little useful information. Let's look at each level of the system to get a better understanding of the problem.

A. The village

Forms seen at the village level may include any or all of the following:

1. Births
2. Deaths
3. Consultations
4. Monthly summary of activities
5. Chloroquinization record
6. Child register
7. Financial record
8. Stock chart
9. Inventory chart
10. Orders for medicines

Reports are written in French, Wolof (including Arabic script), by means of pictures or any combination of the above. Even when records are fairly well kept, many errors exist. Here are some examples.

1. Birth notebook:

   Age may be understood to be the age of the infant at baptism (8 days).

2. Consultation notebook:

   a. The definition of a patient seen for the first time is not consistent.

   b. Symptoms and treatment are sometimes mixed together in the same column.

3. Monthly summary:

(The categories are numbered from 1-28)

(1)	Number of villages: Rarely used
(2,3)	Confusion between patients and new patients
(3-5)	Confusion as to whether or not the number of children under 5 and women from ages 15-45 should add up to the total number of patients seen
(6,10,11)	The distinction between malaria, fever other than malaria and headache is not clear
(7,12,15)	The distinction between diarrhea, stomach ache and vomiting is not clear
(10)	Fever other than malaria is sometimes interpreted as being any other symptom not specifically designated on the form
(19-23)	Sanitation and technology activities are rarely recorded and when done, the meaning of the numbers is not clear
(24,25)	Distinction is not made between live and still births
(26-28)	Deaths are rarely recorded

B. The Health Post

The following include many but not all of the forms that are filled out at this level:

1. Nosology report
2. Monthly PPNS activities including master charts for all weighing sessions
3. Rural maternity report
4. Maternal and child care report
5. Monthly summary of health hut activities
6. Monthly sanitation and health education report
7. Monthly activity reports by the nurse and sanitation technician
8. Monthly, quarterly and annual work plans
9. Chloroquinization report
10. EPI report
11. Self-financing report
12. Status of the community pharmaceutical depot
13. Minutes of the health post monthly coodination meeting
14. Minutes of meetings with the health committee
15. World Bank report form being tested

C. The Department (Medical Center)

Once a month the health post nurses meet with their respective departmental doctors and deliver their reports to the departmental supervisor. The Supervisor in his turn is responsible for the following reports and more:

1. Maternal and child health synthesis
2. Chloroquinization synthesis
3. Synthesis of community pharmaceutical depot reports

4. Trip reports
5. Activity reports of state structures
   a. Infectious diseases
   b. Nosology reports
   c. Dental offices
   d. Family planning
   e. Child protection
   f. Health huts
6. Monthly EPI report
7. Self-financing report
8. Quarterly tuberculosis report
9. Quarterly maternity report
10. Status of the departmental pharmaceutical depot
11. Nosology report of personal consultations

D. The Region

The regional doctor sees several hundred pages of reports cross his desk every month. These reports do not provide management or evaluation information for there is not enough time to read them, let alone do analysis or make decisions based on their contents. Although the need is clear, no statistician has been available to date.

USAID Project Office

Reports are filed by health post. A post folder may contain any or all of the following:

1. Monthly and quarterly health hut activities
2. Monthly activity reports for the health post nurses and sanitation technicians
3. Monthly, quarterly and annual work plans
4. Monthly sanitation and health education activities
5. Village latrine inventories
6. Village well inventories
7. Chloroquinization activities
8. Popular participation report
9. Letters
10. Minutes of various meetings
11. Supervision reports from departmental inspectors and doctors
12. NCH reports

E. The National Level (Office of Statistics)

The same problem exists. There are too many reports and too few means and personnel.

F. Summary

By ambitiously wanting to know something about everything, we have ended up by knowing little about anything. During Phase I of the project, strict attention has not been paid to the severe constraints of personnel, training needs, supervisory needs, supplies and costs.

In spite of the fact that some of the existing reports are of little value, they continue to be generated, confirming one of the basic laws of information systems that states that a report form once created, rapidly assumes a life of its own. Now there is a general consensus that something must be done. Data and information are needed at all levels for management and evaluation purposes. The question is how do we get there from here?

Finally, to say that the information system has been dysfunctional is not to say that it has been useless. Experience has been gained regarding what is or is not feasible and existing records can still be a rich source of information if there are those who are willing to put the required time and effort into the analyses.

IV. PROPOSAL FOR A SIMPLER MIS

A. What should be measured?

Ideally we would like to be able to measure health and the means of achieving it. In practice, even under the best of circumstances, this is not easily done. First, even if we agree with WHO's definition of health, it is not easily operationalized into operational terms. Second, we cannot measure all inputs and outputs, and even if we could, we are often unsure of the existence, magnitude and direction of the relationships between them.

Thus the best that we can do is to carefully choose a few proxy indicators which will serve as a basis for cautious estimation of the effectiveness of our activities. What are the desirable properties of these indicators? WHO proposes that they should be of four types.

1. Health policy indicators
2. Social and economic indicators
3. Provision of health care indicators
4. Health status indicators (13)

Other concerns often expressed are that the indicators:

1. Be qualitative as well as quantitative
2. Be achievable, measurable, reliable, valid, sensitive to change and relevant

To these general notions let us now add the stringent criteria that this project imposes on the information system.

1. Integration into the Ministry of Health
2. Feasibility at all levels given personnel and financial constraints
3 Simplicity
4. Provision of indicators for evaluation of progress and impact
5. Provision of indicators for decision-making
6. Standardization to allow comparisons with other PHC projects, both national and international
7. Timely feedback at all levels
8. Provision of the basis of an epidemiological surveillance system

B. A Basic Proposal

The most basic information system consists of 4 indicators which can be calculated from 6 variables generated from 2 notebooks in each village. It is important to note that none of the indicators require the use of population figures.

1. a. Indicator: Low Birth Weight
   b. Definition:

$$\frac{\text{Live born babies with birth weight less than 2.5 kg}}{\text{Total number of live born babies}} \text{ 2.5 kg} \times 100$$

c. Range: LDC's: Up to 50%
DC's: Down to 4%
World Average: 17%

d. Data Source: Birth notebook

e. Interpretation: Low birth weight is considered to be the most significant indicator of risk to the survival, growth and development of a newborn. Thus it identifies babies who need special care. It is also an indicator of the health and nutritional status of the mother and if high may be evidence of such things as short birth intervals and chronic malaria.

2. a. Indicators: Infant mortality rate

b. Definition:

$$\frac{\text{Number of deaths under 1 year during a time period}}{\text{Number of live births during the same period}} \times 1000$$

c. Range: LDC's: Up to 200/1000
DC's: Down to 15/1000
World Average: 90/1000

d. Data source: Village birth notebook
Village death notebook

e. Interpretation: The IMR has long been used as an indicator of infant health status, maternal health status and the effectiveness of health services and family planning. It is also a measure of socio-economic status, being sensitive to environmental sanitation and standards of living. It should be noted that although the IMR is often expressed on an annual basis, it can be calculated over any time period provided that it is the same for both the numerator and denominator.

3. a. Indicator: Preventable infant mortality rate

b. Definition:

$$\frac{\text{Number of deaths from age 8-364 days}}{\text{Total number of deaths under 1 year}} \times 100$$

c. Range: LDC's: May be greater than 80%
DC's: May be less than 20%

d. Data source: Village death notebook

e. Interpretation: In situations where population figures are not accurately known, this indicator (also called a segmental ratio) is often used. The assumption is that death during the first 7 days of life is a combination of maternal, birthing and infant variables which to a large degree are not preventable (they are endogenous). Deaths after this period are more likely to be preventable (exogenous). Thus this indicator measures infant health status, the effectiveness of health services and the standard of living of the community.

4. a. Indicators: Under 5 proportionate morality

b. Definition:

$$\frac{\text{Number of deaths under 5 during a time period}}{\text{Total number of deaths during the same period}} \times 100$$

c. Range: LDC's: Up to 60.
DC's: Down to 2.
d. Data source: Village death notebook
e. Interpretation: This indicator is a measure of such variables as the birth rate, the childhood mortality rate and life expectancy in the community.

C. An expanded basic system

A consultation notebook can be added to the ones for births and deaths. The minimum number of variables is 4.

1. Total consultations
2. Total receipts
3. Total expenses
4. Cash on hand

After the end of the month, a monthly summary can be made either by the village health worker going to the health post or someone from the post coming to the village. Six indicators can be calculated from this data.

1. a. Indicator: Percentage of health huts functioning
   b. Definition:
   $$\frac{\text{Number of active health huts}}{\text{Total number of health huts}} \times 100$$
   c. Interpretation: An indicator of the viability of the PHC system
2. a. Indicator: Averge number of consultations/health hut
   b. Definition:
   $$\frac{\text{Total consultations}}{\text{number of active huts}}$$
   c. Interpretation: An indicator of the volume of health services
3. a. Indicator: Average receipts/hut
   b. Definition:
   $$\frac{\text{Total receipts}}{\text{Active huts}}$$
   c. Interpretation: An indicator of financial management
4. a. Indicator: Average expenditures/hut
   b. Definition:
   $$\frac{\text{Total expenditures}}{\text{Active huts}}$$
   c. Interpretation: An indicator of financial management
5. a. Indicator: Average cash on hand/hut
   b. Definition:
   $$\frac{\text{Total cash on hand}}{\text{Total active huts}}$$
   c. Interpretation: An indicator of financial management
6. a. Indicator: Average payment/consultation
   b. Definition:
   $$\frac{\text{Total receipts}}{\text{Total consultations}}$$
   c. Interpretation: A measure of the patients' ability and/or willingness to pay for medical services

D. An advanced system

If feasible, the main reason for the consultation (chief complaint) can be categorized into fever, severe cough, diarrhea and other in the consultation notebook. This would permit the calculation of three additional indicators extremely useful for passive epidemiological surveillance.

1. a. Indicator: Proportion of consultations for fever
   b. Definition:

$$\frac{\text{Cases of fever}}{\text{Total consultations}} \times 100$$

   c. Interpretation: An indicator of the relative importance of malaria
2. a. Indicator: Proportion of cases of severe cough
   b. Definition:

$$\frac{\text{Cases of severe cough}}{\text{Total consultations}} \times 100$$

   c. Interpretation: This is a measure of the relative importance of respiratory diseases including whooping cough, measles and even tuberculosis. The presence or absence of measles in villages where immunization campaigns have been carried out is a measure of the quality of the vaccines.
3. a. Indicator: Proportion of consultations for diarrhea
   b. Definition:

$$\frac{\text{Cases of diarrhea}}{\text{Total consultations}} \times 100$$

   c. Interpretation: Even though diarrhea may be associated with malaria, measles and malnutrition, this is a measure of the relative importance of gastro-intestinal diseases

E. Data collection and analysis

The initiation of a functioning management information system is an applied research priority. Several examples of birth, death and consultation notebooks are presented in Annex A (1-3), the final versions of which will be determined through field testing and coordination with the office of statistics of the Ministry of Health. The long term goal is that every village have birth and death records and that every health hut also have health service records. These may be kept in French, Wolof or any other Senegalese language, in Roman or Arabic script or in pictures.

The following are some general observations concerning these records:

1. The use of widely available, inexpensive notebooks lessens the chance of running out of paper. The only other equipment needed are pens and straight edges.

2. The notebooks will contain more data than is sent to the health posts for routine reporting. This extra information is of interest to the villagers and will be available for special studies, the evaluation of the technical interventions and epidemiological surveillance.

3. Feedback to the villagers is immediate. The notebooks provide for monthly and annual summaries to be made in the village with or without the assistance of someone from the health post (nurse or sanitation agent). Simple graphs can even be drawn.

4. The variables which are to be used in the MOH reporting system are starred and letter coded to facilitate data collection and analysis from the post up to the national level.

5. Villages should have flexibility in deciding who is responsible for each notebook. Sometimes the first aid worker handles all three, the birth attendant may have a student help her, the president of the health committee may keep duplicate copies, the village chief may be involved or any combination of the above.

6. Some of the variables require special attention during training and supervision.

a. How does one distinguish between a live and a still birth? Underrecording of live births will raise the low birth weight and infant mortality rate.

b. A still birth should be recorded in the birth and not the death notebook.

c. How is a child's first birthday determined? The age at which a child begins to walk is too variable to be a useful indicator of 1 year of age. Error here will bias the IMR and the preventable infant mortality rate.

d. How is 5 years of age determined? Is it the age at which a child can touch his ear by reaching over the top of his head with his arm? Error here will bias the proportional under 5 mortality rate.

Once the village data enter the MOH routine reporting system, then what happens?

1. A prototype of a single, standard reporting form is proposed for use at all levels (Annex A-4).

2. Likewise an example of an instruction sheet is presented which defines the indicators and explicitly shows how they are calculated. (Annex A10) Having only 2 printed forms in the system lessens the chance of running out of them.

3. Analysis is to be done at all levels so that feedback is immediate for decision-making and evaluation. If care is taken to insure that huts, posts and medical centers are always listed in the same order on the activity report (alphabetically or by number codes) the analysis and interpretation will be much easier. The health hut activity report may be filled out monthly at each level while the calculation of indicators might be as follows:

a. Health post: Indicators # 5-13: Monthly
1-4: Annually (there will be too few cases to do these more often)

b. Medical Center/Region: All indicators quarterly and annually.

4. Two copies of each report should be produced, with one being kept and one going to the next higher level. The one exception may be the region where with 3 copies one can be kept, one sent to AID and one sent to the office of statistics at the Ministry.

5. One person should be responsible for the reports at each level.

a. Heath post: Nurse
b. Medical center: Inspector
c. Region: The statistician, if and when one is assigned to the region, otherwise one of the inspectors

To insure continuity in case of personnel changes, illness and vacations, several people at each level should be capable of filling out the forms. The minimal personnel that should be trained include the doctors, inspectors, nurses and sanitary agents.

6. During training special emphasis should be placed on the importance of the critical thinking that is needed for the information system to be a useful management and evaluation tool.

Here are two examples of how the information can be used:

a. A higher than average infant mortality rate in the health huts of a given post may indicate an outbreak of measles or dysentery.

b. A lower than average low birth weight percentage may mean that a chloroquinization campaign of pregnant women has been successful.

7. When calculating birth and death indicators, one must be sure the data comes from the same villages. For example, if recorded deaths come from more villages than recorded births, the indicators will be biased. Having each village (including the polarized villages) keep its own birth and death records is one way to minimize this problem.

8 Ideally the health hut monthly reports should include the last day of the month, for if villages are submitting data for different numbers of date each month, there will be error in the indicators. Thus the health post nurses should have adequate time to prepare their reports before their monthly meetings with the doctors at the Medical Centers.

F. Information Needs

What are the information needs for management and evaluation and does this MIS provide some help? There are 3 major levels of concern.

1. The villagers

They know that birth and death registries facilitate the acquisition of official birth and death certificates, the former being more important than the latter. They are also concerned about high levels of child mortality. They want to know if the health hut is active, if the supply of medicines is adequate and whether or not the money is being managed properly.

2. The MOH and AID personnel who are implementing the project in the Region of Sine-Saloum.

They need the following:

a. Valid and timely information that will permit the setting of priorities, rational decision-making, the setting of objective goals and the monitoring of progress towards those goals.

b. Information is also needed for the preventive interventions to be introduced. For example, birth notebooks can provide the basis for child censuses useful for programs dealing with malaria, immunization and nutritional surveillance.

c. The death records provide a means of looking at project impact and might indicate that changes in priorities be made.

d. The three main symptoms in the consultation notebooks represent the three major causes of child mortality and thus provide a passive surveillance system.

3. The MOH and AID at the national level

Here there is less concern with the day to day implementation concerns of the project and more with the evaluation uses of the indicators. As has been stated, the requirements of these indicators are that they provide a basis for impact evaluation, comparison with other PHC projects and economic analyses.

There is no doubt that this proposal will undergo many changes and improvements as it is tested and integrated into the MOH reporting system. If it is found to be feasible, then it will represent a modest beginning towards the satisfacton of the tremendous appetite for information that is felt all the way from the village to Dakar.

V. MICRO COMPUTERS AND PHC

A. A year ago the "COMPUTER" was proclaimed "Man of the Year" by Time Magazine. Since then the industry continues to evolve ever faster and invade more areas of our lives. Now there is a debate as to whether or not the phenomenon is a passing fad being foisted on unsuspecting consumers or a tool that will open the door to the new age of information. Interest is also rapidly increasing regarding the use of micro-computers in developing countries. For example the World Center for Micro-Electronics and Human Resources in Paris has proposals for introducing computers into a primary school in Dakar that will respond to spoken Wolof.(14) Another of its ideas is to provide village health workers in Chad with solar powered computers equipped with laser-read video and audio disks that would provide a complete medical information system.(11) Also in Dakar, the College of Saint-Michael has just opened a micro-computer department.(15)

Our specific question is the extent to which micro-computers represent an appropriate technology for PHC, and if so, how? To clarify the debate, the following observations are presented:

1. The computer is not a "magic solution" to our problems but just a tool which may be used or abused.

2. Increasing sophistication of computers is being accompanied by increasing ease of use and decreasing costs.

3. One does not have to be a programmer to use a computer.

4. The French speaking world is far behind the English speaking world.

5. International health is far behind other disciplines.

6. Electrical and maintenance problems are present in Senegal but can be overcome.

7. A micro-computer is of interest for far more than just data analysis.

8. Many are talking about computers, fewer have extensive experience with them and the only way to get that experience is to sit down in front of a keyboard and begin learning.

9. There is no question that this project has tremendous needs that can be lessened by a micro-computer in the areas of management, accounting and data analysis.

My recommendation is thus that a computer be placed in Kaolack, provided that the following preconditions are satisfied:

1. There is agreement as to who should be responsible and have access to it. The presence or absence of a statistician in the region will influence this decision.

2. A suitable room for the computer is available. It should be as dust-free as possible and will probably require air conditioning in the hot season.

3. Someone is available for on-the-spot training concerning installation, maintenance (both preventive and curative), the use of commercial programs and possibly some programming. At least one of the technical assistants should have these skills.

4. Funds should be available for the purchase of additional hardware and software as needs are identified, for Apple Club memberships and for literature in the form of books and magazine subscriptions.

5. The computer is treated as an applied research project with evaluation of its use and cost/effectiveness to be done after at least a year.

Assuming then that a computer and accessories will be purchased, what should be done?

B. Which computer?

The first question is what brand of computer should be bought? There are hundreds of brands available, each claiming to have some advantage over the others. In Senegal, Apple and IBM are the two main brands being introduced. I recommend the French version of the Apple IIe for the following reasons:

1. It can now be purchased locally at the Apple Computer store at 26, Victor Hugo Street. (Owner: Jean-Claude Levy) IBM PC's are not yet available in Dakar.

2. Mr. Levy provides a one year guarantee for equipment purchased from him and has received repair training from the Apple outlet, SEEDRIN, in Paris.

3. The computer has a keyboard that can be changed from American to French (QWERTY to AZERTY) at the flip of a switch.

4. There are at least 100 Apples already being used in Senegal.

5. An Apple club was started in March, 1983 in Dakar. Its name is Microtel Dakar and it is seeking affiliation with Microtel France. It also appears that the Apple store offers a 10% discount to members. The following people are three key members:

a. Mr. Bruyas - President
Cours Sainte-Marie (Ecole des Maristes)
P.O. Box 98
Telephone: 21-08-29 or 21-73-18

b. Mr. Ghesquier - Technical Director

He has given courses in basic programming and is involved in the introduction of micro-computers into the office of statistics of the Ministry of Education.

c. Christian Kvechlin - Treasurer
Telephone: 21-98 06

He has also given basic programming courses.

C. Hardware

1. Minimum equipment to start

a. Apple IIe (French version) computer

b. One 9 inch monitor-amber or green with a minimum resolution of 1000 lines/inch. A Sanyo monitor has the advantage of also being able to run directly from 12 volts DC.

c. Two Apple disk drives (Disk II) with disk controller card.

d. Dot-matrix printer (that can handle all French accent marks) with parallel printer card.

e. Cooling fan.

f. An 80 column board.

g. Power conditioner - Ideally this should be more than just a surge suppressor, for electrical problems include blackouts, brownouts, voltage transients and the primary cause of compter error, electrical noise.(16)

h. A digital multimeter and a kit including soldering iron, rosin core electronic solder, wire cutter and needle-nosed pliers.

i. Plastic covers for the equipment.

j. An anti-static device - This may be a rubber mat or a device attached to the computer that one touches to discharge static electricity.

k. A thermometer/humidity indicator.

2. Uninterrupted Power Supply (UPS)

With only the above minimal system, a power outage will cause whatever is in the computer's memory (RAM) to be lost. For example, if one has been typing for a long time without saving to a diskette and a power outage occurs, then one must start all over. The way to solve this problem is to have a battery backup. The Sahel Institute in Bamako, Mali has been using IBM PC's for the past two years with such a system and has had no electrical problems. The additional hardware requirements are these:

a. 12 volt battery - Preferably deep-draw or marine type
b. A battery charger
c. An inverter that converts 12 volts DC to 110 AC. Although some claim that a modified sine wave inverter is necessary, the Sahel Institute has successfully used square wave inverters (such as Powerverter).
d. A transformer to convert 110 AC to 220 AC

3. Other hardware

There are literally hundreds of peripherals available for the Apple computer. If the computer is eventually used for the statistical analysis of large data bases, the following equipment might be indicated:

a. Memory expansion card
b. Hard disk
c. Mark sense card reader

If the printer is being used much of the time, then a printer buffer that permits one to use the computer while the printer is printing, is a tremendous time saver. A graphics tablet may also be very useful. In the area of energy, solar panels could be used to charge the 12 volt battery.

D. Software (Programs)

Thousands of programs exist for the Apple, ranging from those that are free to those that are very expensive. The two major disk operating systems that are used are DOS 3.3 and CPM. I would recommend starting with the former. The APple store in Dakar advertizes an integrated package consisting of 4 programs.

1. Apple Writer II: Word processing
2. Multiplan: Spreadsheet
3. Quickfile: Data base management
4. Business Graphics: Graphic representative of data

Rather than buying such an expensive but incomplete package at one time it may be wiser to start small and add on as needs and experience allow. An adequate number of programs to start could be as follows (all of the ones suggested are DOS 3.3):

1. A work processor: Apple Writer II (French version) This will allow word processing to be done in French and in English. It is a powerful program that is easy and fun to use, has its own programming language or special applications and allows print styles to be easily changed in the text. See Annex B.

2. A spreadsheet: The Spreadsheet II (cheaper and more flexible than (VISICALC)

3. Programming utilities: The Carpenter

By joining the club Call Apple in Seattle, Washington, one can buy this program and The Spreadsheet II at very reasonable rates and also get a subscription to a very useful monthly magazine called Call Apple.

4. A graphics generator: Apple Plot

5. A graphics dump program: Zoom Graphics or Graphtrix

6. Data base management: File Cabinet (a public domain program no charge)

7. Programming package: M2C2 Basic F

This program allows one to do programming in a French version of BASIC and automatically translates it into standard Applesoft BASIC or vice versa. It can be purchased in Paris for 581 FF at the following address:

Mini Micro Computer Corporation
27 Rue Madeleine Michelis
92200 Neuilly
Telephone: 738-13-72

8. Statistical analysis: ASTAT

9. Copy programs:

   a. Super Disk Copy III
   b. Locksmith 5.0
      (This is a nibble copier that can be used to make backups of many locked programs)

10. Diagnostic program: Master Diagnostics or XPS - Diagnostic IIe

11. Head cleaning diskettes: Data Life Head Cleaning Kit (get several of these for regular cleaning of the heads of the disk drives)

12. Blank diskettes (5 1/4 inch)

Many good brands exist including Verbatim, Memorex, Elephant and others. For better performance, only buy those with hub rings.

E. Computer Room Checklist

Trouble-free performance of the computer will be enhanced if certain rules are observed. They should include the following:

1. Air temperature is kept between 63 and 79 degrees and humidity between 40 and 60%. Extremes may cause problems with static electricity.

2. There should be no smoking, eating or drinking near the computer.

3. Equipment should be covered when not in use to protect against dust and sand.

4. Daily and weekly cleaning routines should be established.

5. If possible, backup disks should be stored away from the computer, so that in case of fire or theft, all is not lost.

6. Pay attention to security. Are there good locks and who is responsible for the keys?

7. Diskettes require special care.

a. Store them vertically in their protective envelopes
b. Do not write on them
c. Do not bend or fold them even though they are called floppy disks
d. Do not touch the surface of the diskette, as finger prints can cause errors
e. Do not expose to direct sunlight
f. Do not use near magnets or magnetic fields

F. Where and how should purchases be made?

There is no question that choice of products is greatest and prices are cheapest in the United States. The minimum that should be bought in Dakar to assure a service guarantee would be the computer monitor, the disk drives and the printer. Although the store owner advertizes that he is an official Apple dealer, he in fact is not. The closest official dealership in Francophone Africa is in Abidjan and the owner's name is:

Boubacary Touré
Telephone: 32-85-35
Telex: 2685 FINAN

When possible, French versions of programs should be bought, and this may require purchase in France. For example, Apple Writer II (Version Francaise) and M2C2 Basic F can be purchased in Paris.

Costs in the U.S. can be lessened by several means. As already mentioned, membership in the Call Apple club allows one to buy software and hardware at tremendous savings. The project could also become a member of a cooperative. One such organization is the Computer Cooperative, Inc. in Haslett, Michigan. Services include discount prices, a catalogue service, product evaluation and a return of 85% of the profits to members annually. This is an excellent source for hardware (everything except computers), software, printer ribbons, blank diskettes, plastic boxes for storing diskettes, power supplies, etc.

G. Literature

The way one learns to use a computer is by hands-on experience, exchanging ideas with other computer users and reading the literature, especially the magazines. In the U.S. there are literally dozens to choose from, in France far fewer. The following are some of the micro-computer magazines in France:

1. Votre Ordinateur
2. L'Ordinateur Personnel
3. L'Ordinateur Individuel
4. Micro-Systèmes
5. LED - Loisirs Electroniques d'Aujourd'hui
6 Electronique Pratique
7 Micro
8 Ordinateur de Poche
9 POM'S

The U.S. magazines that are most useful and informative include Call Apple, Nibble, Peelings (for product evaluations) and Byte. I would recommend at least 2 subscriptions at the beginning: Call Apple and POPC's.

As for books, there are a tremendous number to choose from. The following would be a minimal library:

1 Apple Reference Manual
2 DOS 3.3 Manual
3 Printer Manual
4 Applesoft Programming Manual
5 Applesoft Tutorial Manual
6 Manuals or instruction sheets for each program purchased

The University Bookstore in Dakar carries a fairly wide selection of computer books in French. One might start with two books by Jean Yves Autier.

1. Le Basic de l'Apple II

2. Le Systeme Graphique et l'Assembleur de l'Apple II

Another good book to have would be le Guide Marabout de l'Ordinateur Chez Soi by Ilya Virgatchik. It gives a general introduction to micro-computers and contains a very useful English/French dictionary of the most common technical terms.

H. Institutional Resources

1. Sahel Institute, Bamako, Mali (Two years experience with IBM PC's being used for data entry in a research project)

a. Pap Syr Diagne - Director
b. Naffissatou Diop - Programmer

2. Apple Computer Incorporated
20525 Mariani Avenue
Cupertino, California 95014

Ron Boring - Market Development Specialist
Telephone: (408) 973-3241

He has been to Dakar and is interested in establishing an official dealership here.

3. Michigan State University

The Department of Agricultural Economics has been doing considerable work relevant to the professional use of micro-computers in development.

a. Thomas Stillwell has put together a comprehensive library containing national and international information covering all aspects of micro-computers. He has worked with an Osborne computer in Latin America and is particularly interested in the use of computers in developing countries.

b. Valerie Reilly and Robert Stevens have written several papers consisting of evaluations and comparisons of micro computer statistical programs. See Annex C for titles.

c. Jim Pearce is currently doing an in depth analysis of several statistical programs on several brands of micro computers including the Apple IIe and the IBM PC. The results will be published in the near future.

I. Useful addresses:

1. Gamma Research
Suite 711
6253 Hollywood Boulevard
Los Angeles, California 90028
Telephone: (213) 463-2345

This company produces a variety of battery packs and transformers which may be very useful.

2. Energy Sciences
832 Rockville Pike
Rockville, Maryland 20852
Telephone: (301) 279-0988

Their catalogue entitled "The Solar Wonder Book" ($3) contains information on the state of the art of solar electricity panels, deep cycle batteries, inverters and 12 volt appliances, including electronic refrigerators with no moving parts.

J. Documents in Annex D

D1. A system data sheet on the Apple IIe
D2. A description in French of Apple Writer II
D3. A description of M2C2 Basic F, the program that allows BASIC in French
D4. A list of programs and prices available in Paris from:

La Règle A Calcul
67, Blvd. St. Germain
Paris 5eme
Telephone: 325-68-88
Telex: 220 064 F ETRAV/1303 RAC

VI. OPERATIONAL RESEARCH IN PHC

A. INTRODUCTION

The Sine Saloum is considered to be a testing zone for primary health care by the Ministry of Health. On the other hand, it is clear that this is a service rather than a research project. Technical interventions must be coordinated with and stay within the boundaries of national guidelines and resources will only be minimally increased above the levels of the other regions of the country. To clarify some of the issues, let's look at a series of questions.

1. What is operational or applied research?

Some regard it as a set of sophisticated techniques that scientists from Dakar and elsewhere will bring to the project. Others see it as a systematic approach to problem solving that while often carried out by professors and their students, should also be done by members of the project team, including villagers. Whatever the level of the research, it is agreed that it encompasses more than just biomedical research.(18)

2. Is research a luxury or a necessity?

Since resources are so limited and needs are so great, it would be a natural reflex to want to put all of the budget into the delivery of health services. This, however, would not permit us to know if those services are effective or not. On the other hand, if all the money were spent on research, then we might know a lot about the situation, but we would be unable to do anything about it. The challenge is to find the right mix of service and research to achieve the maximum level of health possible for the people.

3. If research is a necessity, then why does it so rarely seem to provide useful results?

Writing general research objectives into a project document is easy. Implementing the research in the field can be extremely difficult. Even when results are obtained that have pragmatic implications, they are not always transmitted to and acted on by the appropriate decision makers.

4. How can research be made more effective?

One way to start could be to have a training session for those who will be directly involved in the introduction of the technical interventions in the test villages and health posts. The format could be a seminar/workshop where the participants would learn how to choose priorities, learn the steps of designing a research project and then actually design one. An example of how this has been done is given in Annex E.(19)

5. Will this improved research give us scientific proof of the impact of project activities?

The answer probably not. The rules for proving scientific causation are very strict and even in projects with rigid experimental designs and control areas, the analysis of impact is very complex. For example, if at the end of 5 years it is shown that infant mortality rates have markedly decreased, we will be pleased and eager to attribute the result to the project. It is possible, however, that an increase in infant mortality rate may be an indicator of success of the data collection system. In other words, even if deaths have decreased, the fact that a greater percentage of them are being reported, will cause the IMR to rise. This apparent paradox is known as the "discovery effect". Thus although our research may provide valuable results, we must take great pains to attempt to find errors or confounding variables in the conceptualization, implementation and statistical analysis before making claims or causality for this project or generalizing to others.

6. Who will be responsible for the research?

The epidemiologist to be recruited will play a pivotal role in the applied research activities. He/she will be based in Kaolack at the beginning of his/her contract to facilitate the initiation of the technical interventions at the test sites. The research side of the job will be to help elaborate implementation and research designs and assist in training as needed (for example, in the use of the computer for data entry and analysis). The research will be coordinated with the relevant services at the regional and national levels and with the research director at the Ministry of Health in Dakar. Some of the projects may be done by personnel in the region, some by consultants from Dakar, some by students from various schools and some by short term overseas consultants.

7. What will the major research topics be?

The categories presented in the following pages are neither comprehensive nor mutually exclusive. They will give an overview of the wide scope of issues which can be addressed in primary health care. Obviously not all of them can be undertaken and priorities will have to be chosen. As already indicated, the installation of a functioning MIS should be one of the first priorities, for it represents the foundation on which many of the other research projects will build.

B. Major research categories

1. Malaria

a. Importance:

Malaria is a leading cause of low birth weight babies and child mortality. It is also implicated in lost work time among the working age group, which may be critical during the planting and harvest seasons.

b. National policy:

1. Preventive chemoprophylaxis with Chloroquine is advised only for children age 0-5 and pregnant women.

2. Given the appearance of Chloroquine resistance in East Africa, there is concern that monitoring for this eventuality be conducted in Senegal.

c. Research possibilities:

1. Compare a zone where Chloroquinization is systematically carried out with one where it is not.

2. Test different protocols for Chloroquinization. (Once a week, 3 days a week or 6 days a week)

3. Test a policy of presumptive treatment of all fevers with Chloroquine. Compare treatment with 25 mg/kg over 3 days versus 10 mg/kg in a single dose.

4. Monitor for Chloroquine resistance.

d. Resource Institution:

1. Service de Lucte Anti-parasitaire (SLAP) - Dr. Samba Diallo

2. Oral Rehydration

a. Importance: Dehydration due to gastro-intestinal and other diseases is a major cause of child mortality.

b. National policy: The mothers in every family should know how to prepare a rehydration solution. Prepackaged preparations should stop at the level of the health posts.

c. Research possibilities:

1. Compare ORANA and UNICEF packets.

2. Compare packets versus salt and sugar solution.

3. Test the use of the mass media for health education.

4. Test ways of reducing water and food contamination in the household. For example:

a. Waterjars with faucets versus those into which the common cup is dipped

b. Pouring water over hands rather than washing a common bowl before eating

5. Study traditional methods for controlling diarrhea.

6. Find ways of encouraging health personnel to give fewer medicines for the treatment of diarrhea.

d. Resource Institutions:

1. Programme de Lutte Contre les Maladies Diarrhéiques Dr. Bernard Diop

2. CPANA Dr. Ndiaye (Translation of Diarrhea Dialogues)

3. OPTION (Research in the department of Fatick)

3. Expanded program on Immunization

a. Importance: Seven diseases accounting for much child mortality and morbidity can now be prevented by systematic immunization.

b. National policy: The EPI program should be implemented in a fashion that decentralizes decision-making to the regional doctors and keeps vaccines as close as possible to the people.

1. Autonomy of a health structure is preferred to the system of mobile teams.

2. The target group includes children from 0-2 and pregnant women.

3. Village health workers are not to give immunizations.

c. Research possibilities

1. Study where refrigerators should be placed. Should they stop at health centers or also be at the health posts?

2. Find out if the rural communities are interested in purchasing and maintaining refrigerators for health structures.

3. Evaluate immunization coverage and effectiveness.

4. Monitor the quality of vaccines. How long can they be kept at each level?

5. Which refrigerators are best?

6. Can a system be devised to place gas bottles in the pharmaceutical depots?

d. Resource institution:

1. Service des Grandes Endemies Dr. Birane Diouf

4. Nutrition

a. Importance: Malnutrition is a major cause of child morbidity and mortality. From 25 to 33% of children currently in the PPNS program fall in the category less than 80% of the standard.

b. National policy: At present there is no firm national strategy. The future of the PEDS approach depends on the results of an evaluation currently being made.

c. Research possibilities:

1. Evaluate the value of birth notebooks to see how useful they are as a basis for child censuses and how feasible weighing is at the village.

2. If weighing is done, what scales should be used? Are imported ones necessary or can simple ones be made locally?

3. Can a standardized weight for age chart be made for Senegal?

4. Compare the use of arm bands, weight for age and weight for height charts for nutritional monitoring.

5. Are imported food supplements necessary or do villages have adequate ingredients that combined in proper recipes can prevent malnutrition, especially at the time of weening?

6. Is malnutrition just a problem of children? What about the mothers:

7. Are there reasons for malnutrition other than lack of food? What is the effect of prolonging birth intervals through family planning and reducing women's work by such things as improved stoves, pumps for wells and millet grinders?

d. Resource institution:

1. DAMAS - Commandant Sy
- Serigne Diene

5. Tuberculosis and Leprosy

a. Importance: These are endemic diseases which are expensive to treat in health structures and difficult to treat at the village level.

b. National policy: The vertical programs of the past have been replaced by integrated ones. Treatment should be brought as close as possible to the people and ambulatory treatment is preferred over hospitalization.

c. Research possibilities:

1. Are village level surveillance systems feasible?

2. At what levels should different treatment protocols be used?

3. Can village health workers effectively deliver long term treatment?

d. Resource Institutions:

1. National services exist for tuberculosis and leprosy campaigns.

2. A study of tuberculosis is currently being done in the Sine-Saloum by OCCGE.

6. Management Information system

a. Importance: This is the foundation on which we build. Without valid, timely information we have no idea where we are, where we are going or how far we have come.

b. National policy: There is a desire to simplify and reduce the volume of the reporting system. A form proposed by the World Bank is being tested and the project's system should be integrated into that of the MOH.

c. Research possibilities:

As already stated, the suggested system is but a prototype of a possible system. Its implementation will require the coordinated efforts of trainers, artists, experts in functional literacy and supervisors. Different levels of complexity should be tried so that one can be found which is simple enough to be feasible yet sophisticated enough to respond to the wide variety of information needs.

d. Resource institution:

1. Office of statistics (MOH) - Malick Diamé

7. Micro-computer

a. Importance: As the advertisement says, we should work smarter, not harder. This is a tool which because of its sophistication, ease of use and relatively cheap price, offers tremendous possibilities.

b. National policy: Computers are now being used and introduced into government services.

c. Research possibilities:

1. As previously stated, the introduction of a computer into the project should be considered a research subject. One way to evaluate its use would be to keep a logbook, noting date, name of user, time used, program used, purpose and observations. At the end of a year or two an evaluation could be made of the volume and type of use, problems encountered and cost/effectiveness.

2. The computer can be used for data entry and statistical analysis for other research projects. Printouts of analysis of consultation records from a village in Mali are presented in Annex F.

3. One could test the effectiveness of calculators in helping people do calculations more easily and accurately. An excellent choice would be Texas Instruments (TI-1006), which is light powered, has no batteries and costs less than $10 in the U.S.

d. Resource institutions (with computer experience)

1. National census bureau

2. Oceanographic research institute at Rufisque

3. ISRA

8. PHC and community participation

a. Importance: PHC cannot succeed if villagers do not see it as something that offers a solution to their expressed needs.

b. National policy: To the extent possible, villagers are to become responsible for their own health. PHC should be a part of integrated development and collaborate with other services that work with villagers.

c. Research possibilities:

1. Is integrated development really more effective than the GOBIFF priorities outlined by UNICEF?

(GOBIFF = growth monitoring, oral rehydration, breast feeding, immunizations, food and family planning)

2. To what extent is community responsibility and participation more than just paying for costs.

3. What indicators can be used to measure community autonomy?

4. What is the role and importance of functional literacy in the organization, motivation and health of a village?

5. How can the project best collaborate with other services such as social development and literacy?

6. Can we define the characteristics of villages and health workers most likely to succeed?

7. What are the different ways villages deal with financial matters related to health but maintenance, support of health workers, and replenishment of medicines and supplies?

8. Compare the value of survey versus participant observation as research methodologies? What other possibilities exist?

9. What are the essential medicines at the village level?

10. Are health worker manuals being used? Should they be revised?

11. What alternatives are there to training health workers at the health posts?

12. What is the best methodology of village dialogue. How many visits are necessary, with what content?

d. Resource institution:

1. National school of applied economics (ENEA)

2. ASAFED - Abdoulaye Traoré

9. African traditions

a. Importance: Traditional solutions to problems are often ignored and are in some cases disappearing.

b. National policy: Our traditions are part of our rich heritage which must be encouraged and not allowed to die.

c. Research possibilities:

1. Traditional medicine

a. Identify traditional healers in villages and see how they relate to the PHC system.

b. Introduce some traditional medicines into the health huts. (a mouth wash for gingivitis, for example)

2. Traditional nutrition

This was mentioned under the sections on rehydration and nutrition.

3. Traditional wisdom

a. What proverbs exist that are relevant to health and development? To what extent do they facilitate training and changes in KAP?

b. How can religious leaders of the villages be involved? What does the Coran say about health?

4. Traditional organizations

What organizations exist? What do they do? Are they more effective in mobilizing villages for action than the committees set up by the PHC system?

d. Resource Institutions:

1. Community center for the promotion of the health of Pikine - Cheick Tidiane Thiam

2. Service International d'Appui à la Formation et aux Technologies en Afrique de l'Ouest et au Sahel (AFOTEC - Dakar) Mme. Sy née Rokiatou Tall

3. World Bank PHC project (Mali) Dr. Adama Koné

10. Appropriate technology

a. Importance: Needs are great and resources limited, but even those that exist are often used inefficiently.

b. National policy: One of the national goals is self-sufficiency.

c. Research possibilities:

1. What is the impact of Banaksuf (mid) stoves?

2. Can technologies that have been successful in Senegal be introduced into the project? Some of these include:

a. Improved water storage jars
b. Inhalers for use of traditional medicines
c. Distillers for preparation of traditional medicines
d. Portable head rests for primary dental care in villages
e. Village made silk-screening devices for production of village literature (Yegle is a village newspaper published in the region of Eastern Senegal)

3. What are other ideas that might be tried?

a. Local fabrication of a scale for weighing children
b. Dolls made out of gourds or cans to demonstrate the effects of dehydration in a child
c. Other simplified visual aids
d. Different ways of village level training such as workshops and trips to visit other villages where certain problems have been locally solved. In other words, the encouraging of a village information network.

d. Resource Institutions:

1. CERER
2. Community Center for the Promotion of the Health of Pikine Cheick Tidiane Thiao
3. AFCEC - Rokiatou Tall
4. AGAFED - Abdoulaye Traore
5. ENDA

C. Summary

There are many important and interesting possible research topics. Here are a few final observations to consider:

1. Applied research requires considerable effort and skill in planning, implementation, analysis, interpretation and communication of the results.

2. Research that is not done well is often useless and a waste of precious resources.

3. We should not become so enamored of research that we forget to implement the project..

4. Research findngs should go beyond the MOH and AID to be published in the international health literature. There they will be evaluated by the scientific community and will hopefully be useful to others who are also engaged in the important and difficult struggle called PRIMARY HEALTH CARE.

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RAPPORT SUR LES ACTIVITES DES SOINS DE SANTE PRIMAIRES

(BIFFER LES MENTIONS INUTILES)
POSTE / CM / REGION

MENSUEL / TRIMESTRIEL / ANNUEL.
CASES / POSTES / CM

MOIS: _____
ANNEE: _____

DONNEES	1	2	3	4	5	6	7	8	9	10	11	12	13	14	TOTAL	CODE
1. SITUATION DES CASES																
a) # de rapports des cases attendus																A
b) # de rapports des cases reçus																B
2. CAHIERS DE NAISSANCE																
c) Naissances vivantes																C
d) Nouveaux-nés qui pèsent moins de 2,5 kg																D
3. CAHIERS DE DECES																
e) Décès totaux																E
f) 0-7 jours																F
g) 8-364 jours																G
h) 1-4 ans																H
4. CAHIERS DE CONSULTATIONS																
i) Consultations totales																I
j) Recettes totales																J
k) Dépenses totales																K
l) Sommes en caisse																L
m) # de cas de fièvre																M
n) # de cas de toux grave																N

(BIFFER LES MENTIONS INUTILES) POSTE/CENTRE/DISTRICT

INDICATEURS DES SOINS DE SANTE PRIMAIRES

MENSUEL / TRIMESTRIEL / ANNUEL

MOIS: _____

ANNEE: _____

	INDICATEUR	DEFINITION	FORMULE	RESULTAT
1.	Poids bas à la naissance	Bébés nés vivants avec un poids de moins de 2,5 kg / Naissances vivantes totales X 100	P/N X 100	_____ %
2.	Taux de mortalité infantile	Décès des enfants de moins d'un an / Naissances vivantes totales X 1000	D/N X 1000	_____ ‰
3.	Proportion de mortalité infantile due aux causes évitables	Décès des enfants de 8 - 364 jours / Décès des enfants de moins d'un an X 100	C/D X 100	_____
4.	Mortalité par entérite des enfants de moins de 5 ans	Décès des enfants de moins de 5 ans / Décès totaux X 100	E<5/D X 100	_____ %
5.	Proportion des cases actives	## de rapports des cases actives / ## de rapports des cases attendus X 100	A/R X 100	_____ %
6.	Nombre moyen de consultations par case	Consultations totales / ## de rapports des cases reçus	I/B	_____
7.	Somme moyenne perçue par case	Recettes totales / ## de rapports des cases reçus	J/B	_____ DH
8.	Dépenses moyennes par case	Dépenses totales / ## de rapports des cases reçus	K/B	_____ DH
9.	Somme moyenne en caisse par case	Somme totale encaissée / ## de rapports des cases reçus	L/B	_____ DH
10.	Paiement moyen par consultation	Recettes totales / Consultations totales	J/I	_____ DH
11.	Proportion des cas de fièvre	## de cas de fièvre / Consultations totales X 100	M/I X 100	_____ %
12.	Proportion des cas de toux grave	## de cas de toux grave / Consultations totales X 100	J/I X 100	_____ %
13.	Proportion des cas de diarrhée	## des cas de diarrhée / Consultations totales X 100	D/I X 100	_____ %

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A N N E X V

DRUG LOGISTICS SYSTEM

A N N E X V

DRUG LOGISTICS SYSTEM

SYSTEME DE DISTRIBUTION ET DE GESTION DE PRODUITS PHARMACEUTIQUES A L'USAGE DES CASES DE SANTE DANS LE CADRE DU DEVELOPPEMENT DU PROGRAMME DES SOINS DE SANTE PRIMAIRES SENEGAL/USAID

I - DESCRIPTION DU SYSTEME

Le système est conçu aussi simple que possible pour satisfaire la demande en médicaments de première nécessité.
Il associe intégralement les représentants des comités de santé dans la gestion.

PHARMACIE NATIONALE D'APPROVISIONNEMENT DAKAR
PNA

DEPOT REGIONAL D'APPROVISIONNEMENT PROJET A KAOLACK
KAOLACK/PHARMACIE REGIONALE

Il est géré par le Pharmacien régional et son équipe en collaboration avec bureau du projet et Régions Médicales

DEPOT DU C.S. APPELE DEPOT DE CM
géré par l'APS
- le Superviseur
- le Médecin-Chef de CM.

DEPOT LOCAL DE COMMUNAUTE RURALE OU DEPOT COMMUNAUTAIRE

Il est géré par le comité de gestion du D.C à travers le Président et le trésorier aidés du gérant du dépôt communautaire. Il est supervisé par le CP

DEPOT DE LA CASE DE SANTE.
Il est géré par le comité de santé de la case à travers le comité de gestion.

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II- LES MOYENS

a) Structure

Le système utilise les éléments suivants

- Le dépôt régional au sein de la pharmacie régionale léguée par l'Hôpital de Kaolack et rénovée sur les fonds du projet de santé rurale.

- Les dépôts CM constitués de 2 ou 3 armoires métalliques installés au niveau des centres de santé.

- Les dépôts communautaires constitués par une armoire métallique au niveau du poste de santé au toute autre structure léguée par la communauté rurale.

b) Humains

- un pharmacien régional
- Un assistant au pharmacien
- Deux aides

Il est prévu d'élargir cette équipe par l'engagement (recrutement) d'un comptable, d'une secrétaire, d'un veilleur de nuits d'un manoeuvre et de manutentionnaires.

c) Matériels

- Une camionnette pour l'achat de médicaments.
- L'équipement au sein de la pharmacie régionale.

d) Financiers

- Les fonds générés par la vente des médicaments au niveau de tous les dépôts.

Au niveau régional les fonds sont gérés par le pharmacien régional et la Coordonnatrice du projet.

Au niveau CM et communautaire ils sont gérés par les comités de gestion.

Réponse : 1.000 (pour plus de sûreté, on pourrait commander à 1.500 comprimés. De cette façon il devrait vous rester encore 500 comprimés au moment de la réception de la nouvelle commande. Ceci vous donne une certaine marge au cas où la commande arriverait avec du retard.
Au commencement le personnel du projet devrait fixer un seuil pour lequel devrait intervenir la commande pour chaque médicament du dépôt de la CR, de la CM ou du dépôt régional et de la case de santé. Au fur et à mesure que les informations seront obtenues sur le taux d'utilisation et le temps de livraison que prend une commande à chaque niveau, les cases de santé, les dépôts communautaires, les dépôts de CM et le dépôt régional pourront réajuster en conséquence leurs seuils de commande.

3/ Bon de commande/Livraison - Annexe III

Cet imprimé peut être utilisé à tous les niveaux du système. Il devrait comprendre 3 feuilles (un original et deux autres feuilles détachables de couleurs différentes). Un des feuillets devrait être conservé par l'unité qui fait la commande de médicaments et archivé dans le carnet de commandes.
L'original et un autre feuillet devraient être détachés et envoyés au dépôt fournissant les médicaments.
Quand la commande est satisfaite, les montants et prix exacts (qui peuvent être différents des montants et prix à la commande) sont notés dans la colonne quantité livrée et prix de la quantité livrée sur l'original et les feuillets du carnet de commande.
L'original et un autre feuillet seront détachés et partiront avec la commande de médicaments pour servir de facture/bon de livraison
A la livraison, le destinataire devrait confronter la quantité reçue ainsi que le prix avec le montant de la commande et la quantite de commandée.

../...

Une fois qu'il s'est assuré que la quantité livrée et les prix sont conformes à la commande, les médicaments sont payés. Le montant payé est noté sur l'original et sur le premier feuillet dans la colonne somme reçue. La date est indiquée et l'expéditeur aussi bien que le destinataire signent sur les deux feuillets (original et copie).

Le destinataire garde l'original pour ensuite :

1) Noter les quantités reçues pour chaque médicament sur la fiche de Stock dans la colonne "Entrée", réajuste la quantité restant en stock en conséquence. Il note le numéro du bon de commande dans la colonne "Observation".

2) Il inscrit la somme dépensée dans le cahier de gestion à la colonne "Dépenses du jour" et l'utilisation effective des fonds (médicaments" dans la colonne "Liste des Dépenses";

3) Il archive l'original de bon de livraison dans le classeur "médicaments reçus".

L'expéditeur (dépôt communautaire, de CM ou bien dépôt ragional) conserve un feuillet bon de livraison signé :

1) Il note la quantité livrée dans la colonne sortie de son cahier de stock et réajuste la quantité restante en stock.

2) Il note la somme reçue dans le cahier de Gestion à la colonne "Recettes du jour";

3) Il archive la copie du bon de livraison dans le classeur "Commandes safisfaisantes".

En utilisation ce système, on peut confronter la somme payée et/ou reçue enregistrée dans le cahier de gestion avec le ou les montants dont la liste a été établie sur le Bon de Commande/Livraison pendant une certaine période et ce tous les mois.

.../...

C/ Fiche Inventaire - Annexe IV

Cet imprimé sera utilisé au niveau des postes de santé et du Dépôt régional. L'infirmier chef de poste de santé peut l'utiliser pour :

1) Faire le résumé de l'activité de toutes les cases de santé dans une CR pendant une période déterminée.
2) Faire le résumé de l'activité du dépôt communautaire pendant une période déterminée.

Le gérant ou superviseur du dépôt CM peut utiliser cet imprimé pour :

1) faire le résumé de l'activité de tous les dépôts communautaires pendant une période déterminée - un mois, trois mois, etc
2) Faire le résumé de l'activité du dépôt de CM pendant une période déterminée.

Le gérant du dépôt régional peut utiliser cet imprimé pour :

1) Faire le résumé de l'activité de tous les dépôts de CM pendant une période déterminée.
2) Faire le résumé de l'activité du Dépôt régional pendant une période déterminée.

La fiche d'inventaire devrait être remplie tous les mois pour ce qui est des dépôts communautaires, CM et régional. Une copie de l'inventaire faite au dépôt communautaire devrait être transmise au superviseur de CM à la fin de chaque mois pour qu'il puisse être constamment au courant de ce qui se passe à tous les niveaux du système d'inventaire et prendre des décisions appropriées.

b/ Cahier de Gestion : annexe II

Il est utilisé essentiellement au niveau du dépôt communautaire ou de CM et éventuellement au niveau de la case pour évaluer les sorties ou entrées d'articles en équivalent financier.

.../....

IV - Description de travail du pharmacien régional au niveau du Projet

Le Pharmacien affecté au niveau régional participera à la mise sur pied d'un système efficace de fournitures de médicaments et de services médicaux dans le cadre du programme de santé rurale.
Il est mis à la disposition du Médecin-Chef régional,
Il travaille dans le cadre du projet de santé rurale, en étroite collaboration avec le Coordonnateur du Projet.
Il devra assumer les responsabilités spécifiques suivantes :

- Etablissement de la liste de commande, achat et distribution de tous médicaments et fournitures destinés au dépôt régional.
- Assurer le suivi du système d'inventaire et de renouvellement du stock.

Ceci intéresse également l'utilisation des produits pharmaceutiques à tous les niveaux.

- S'assurer que toute transaction financière s'effectue de façon ordonnée, ponctuelle et régulière à tous les niveaux du système d'approvisionnement.
- Il devra éviter toute rupture de stock à quelque niveau que ce soit
- En collaboration avec le personnel du projet, établir une politique des prix des médicaments et fournitures qui puissent assurer un revenu de la vente des produits aux villageois suffisant pour permettre le renouvellement du stock sans faire appel à des subventions du Ministère de la Santé.
- Effectuer des tournées régulières dans les CM, CR, les cases de santé pour superviser le fonctionnement du système d'approvisionnement at de gestion.

Il assistera également aux réunions mensuelles du projet et, le cas échéant, aux réunions de coordination départementale des CM.

.../...

- Il effectuera des évaluations ponctuelles au niveau du système d'approvisionnement et de gestion des dépôts et formulera des recommandations.

N: Ces tâches peuvent être déléguées à l'Assistant par le Pharmacien et devront être exécutées comme précitées.

- GESTION DU DEPOT COMMUNAUTAIRE DE MEDICAMENTS

a) LIEU locaux appartenant à la CR :

- Poste de santé
- Maternité rurale
- Maison communautaire
- Foyer des jeunes
- Foyer des Femmes
- Maison propre (?)
- Abri provisoire
- Dépôt construit par la CR

Le projet devra fournir : Armoires à étagères pour stockage des médicaments

b) Comité de Gestion : Sont membres de ce comité tous les présidents de comité de gestion des cases de la associés au comité de gestion du poste de santé.

c) Procédure : Une réunion devra se tenir en présence de tous les Présidents de comité de gestion de case et désignera :

- un Président
- un Président adjoint
- un Trésorier
- un Trésorier adjoint
- un gérant de dépôt de CR
- des assesseurs.

.../...

c) Il est souhaité que le Président, le Trésorier et le Gérant habitent chef-lieu du Dépôt CR ou dans un village proche du chef-lieu.

d) Organisation des ventes : choisir les jours de marché où le comité peut être plus disponible.

Tâches - Le Président : Personne morale assistée du Chef de poste
- convoque les réunions
- dirige les réunions
- retient en tête et fait exécuter les décisions du comité
- contrôle le gérant du dépôt de CR et le trésorier et vérifie le stock de façon régulière et ce tous les mois
- autorise des dépenses pour toutes les commandes.

- Le Trésorier :
- Récupère les recettes du dépôt après chaque vente
- tient à jour son cahier de gestion
- débloque les fonds nécessaires pour satisfaire les nouvelles commandes et ce sur les directives du Président du comité
- expose la situation financière du dépôt à chaque réunion.
- Procéde à l'achat des médicaments et à la réception par le comité de gestion.

Le Gérant du Dépôt de Médicaments de la CR
- Vérifie le stock avec le Chef de poste en début et en fin de journée de vente
- vend les médicaments
- tient à jour son cahier de gestion ou le cahier de stock
- tient à jour les fiches ou le cahier de stock

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- garde le carnet de bons de commande/Livraison
- range les médicaments dans l'ordre
- verse les recettes du jour au trésorier
- Etablit les commandes sous la supervision du CP

- Autres membres du Comité de Gestion du Dépôt Communautaire de Médicaments

  - les membres de ce comité participent aux réunions mensuelles du comité
  - Contrôlent la gestion du Trésorier et la Gestion du stock du dépôt
  - participent à la détermination des modalités de vente :
    à la fixation des jours de vente
    à la fixation des prix des médicaments
    à l'inventaire périodique du dépôt
  - assurent la liaison entre le dépôt communautaire et les cases de santé de la CR (Diffusion d'information)

- Le Chef de Poste de Santé

  . supervise le fonctionnement et la gestion du DC en contrôlant l'évolution du stock (entrées et sorties)

  la tenue des documents de gestion

  la validité des commandes venant des cases

  la gestion financière,

  . Supervise l'établissement de la commande du dépôt communautaire qu'il fait viser par le Président du Comité de gestion

  . remplit la fiche mensuelle d'inventaire du dépôt et l'envoie au superviseur de CM en même temps que le résumé des cases.

  . procéde à l'achat de médicaments à la CM lors des réunions de coordination si le comité le lui demande.

- Le Superviseur départemental

  . Supervise le chef de poste pour la gestion et le fonctionnement du dépôt communautaire

../..

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. contrôle la validité des fiches mensuelles d'inventaire en comparaison avec les stocks et les documents de gestion

. rend compte au Médecin-Chef de CM le plus rapidement possible de tout problème de gestion rencontré au niveau des dépôts.

- Le Médecin-Chef de CM

. supervise le fonctionnement et la gestion du DC dans le cadre de ses tournées de contrôle périodique

. redresse les situations anormales signalées par le superviseur

. avise le pharmacien régional en cas de nécessité.

VI - GESTION DU DEPOT DE CM

a) Lieu : local dans le centre de santé désigné par le Médecin-Chef

b) Comité de Gestion : - membres de l'APS
- Médecin-Chef de CM
- Superviseur

c) Procédure : Une réunion se tiendra pour permettre à l'APS de nommer deux ou trois de ses membres pour la gestion du dépôt et de prendre connaissance des modalités de gestion et des rôles de chacun des membres.
Le comité sera composé d'un Président
d'un Trésorier
d'un Gérant
du Médecin-Chef de CM
du Superviseur de CM

d) Organisation des ventes : Il est souhaitable d'avoir un jour fixe de vente au niveau de chaque CM et d'en informer les bénéficiaires.

Il est souhaitable aussi d'organiser une vente de médicaments le jour de la réunion de coordination de la CM pour permettre d'amoindrir les coûts de transport.

.../..

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e) Tâches :

Le Président : Personne morale assistée du Méd/Chef de CM convoque les réunions et les dirige

- Fait exécuter les décisions du comité
- contrôle le gérant et le Trésorier
- autorise les dépenses pour toutes les commandes
- coordonne ses activités avec le Méd/Chef de CM et le superviseur
- cogère le Compte du dépôt CM avec le Méd/Chef
- ~~Contresigne les chèques~~

Le Trésorier :

- récupère les recettes après chaque vente et les dépose régulièrement au niveau du compte
- tient à jour son cahier de gestion
- récupère les fonds à la Banque pour acheter les médicaments au dépôt régional
- signe les chèques
- expose la situation financière du dépôt à chaque réunion et présente les pièces justificatives

Le Gérant :

- ~~assure la propreté et la tenue~~ du local et des armoires
- vérifie le stock avec le superviseur avant et après chaque vente
- vend les médicaments
- tient à jour ses documents de gestion (cahiers de gestion, cahier de stock)
- verse les recettes du jour au Trésorier après le contrôle du superviseur.
- Etablit les commandes sous la supervision du superviseur

.../...

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Le Superviseur

- supervise le fonctionnement et la gestion du dépôt
- vérifie le stock avec le gérant avant et après chaque vente
- contrôle les recettes après chaque vente.
- vérifie la tenue à jour des documents de gestion du dépôt
- contrôle et vise toutes les commandes venant des DC
- Supervise l'établissement des commandes et les fait viser par le Méd/Chef de CM

Le Médecin-Chef

- contrôle périodiquement le fonctionnement et la gestion du dépôt
- cogére le compte du dépôt avec le Président
- garde le chèquier
- vise les commandes
- convoque le Président et le Trésorier en cas de commande et de contrôle de gestion
- coordonne avec le Pharmacien régional son assistant lors de leurs tournées de supervision
- rend compte au pharmacien régional en cas de problèmes au niveau des dépôts.

- LA GESTION DE LA PHARMACIE REGIONALE

La gestion de la pharmacie régionale et du dépôt régional fera l'objet d'un document écrit, suite aux changements intervenus avec les décisions du MSP à cet effet.

.../...

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VIII - SUPERVISION

L'examen de ce document démontre une fois de plus l'absolu nécessité et la constance de la supervision à tous les niveaux.

CHEF DE POSTE	C.S - DEPOT COMMUNAUTAIRE	MENSUELLE HEBDOMADAIRE JOUR DE VENTE
Superviseur départemental	- Chef de poste pour le dépôt communautaire - Gérant du dépôt CM	mensuelle jours de vente
Médecin-Chef de CM	- Superviseur et les CP pour le dépôt communautaire - le Superviseur pour le dépôt CM	périodique mensuelle
Pharmacie régionale ou Assistant	- Superviseur pour le dépôt CM, DC et CS - Dépôt régional	mensuelle au besoin journalier

FICHE JOURNALIERE DE DISTRIBUTION DES MEDICAMENTS

ANNEXE I

CASE DE SANTE .....

MOIS DE .....

MEDICAMENT																													
Aspirine																													
Chloroquine																													
Auréomycine1																													
Auréomycine3%																													
Parégorique																													
Fer																													
Ascabiol																													
Poudre à hydrater																													
Alcool																													
Compresse																													
Bandes																													

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FICHE DE STOCK

Annexe II

NOM DU PRODUIT

LOCALITE

DATE	ENTREE	SORTIE	RESTANTE EN STOCK	OBSERVATIONS

Pensez à vous réapprovisionner lorsqu'il vous restera _____

ANNEXE IV

FICHE INVENTAIRE DE MEDICAMENTS Localité : _____

POUR LA PERIODE DU _____ au _____

NOM DES PRODUITS	STOCK AU DEBUT	ENTREE	SORTIE	STOCK A LA FIN DE LA PERIODE CONSIDEREE	SEUIL DE REAPPROVISIONNEMENT
1. Aspirine					
2. Chloroquine					
3. Auréomycine 1%					
4. Auréomycine 3%					
5. Parégorique					
6. Pipérazine					
7. Fer					
8. Ascabiol					
9. Poudre à réhydrater					
10. Alcool					
11. Compresse					
12. Bandes					
13.					
14					

CAHIER DE GESTION

(Pour le dépôt communautaire)

DATE	ARTICLES OU PRODUITS	CFA ENTREE	CFA SORTIE	CFA TOTAL

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ANNEXE VII

FICHE DE COMMANDE DES MEDICAMENTS

DATE : ______________________ Case de SANTE DE : ____________________

N°	NOM DU PRODUIT	QUANTITE	P.UNITAIRE	PRIX TOTAL	OBSERVATIONS
			TOTAL =		

Prénom et nom et signature du Président du comité de gestion de la case de santé

Prénom et nom et signature du Trésorier du comité de gestion de la case de santé

Prénom et Nom et Signature du Chef de poste ou du vendeur

A N N E X V I

FINANCIAL OVERVIEW - TABLES

A N N E X V I

FINANCIAL OVERVIEW - TABLES

Figure I : COSTS GENERATED BY THE KAOLACK REGIONAL TRAINING CENTER
APRIL 1984 - MAY 1986

YEAR	SERVICE		AMOUNT
1984	RENOVATION OF CENTER	CFA	2.281.775
	MAKING BLACKBOARDS, STEP-LADDERS, DOORS, CURTAINS, AND TABLES		136.000
	GM OFFICE BOOK		85.500
	WATER CONNECTION		146,154
	TABLES EQUIPMENT FOR CENTER		146,700
	CURTAINS INVOICE FOR CENTER		129,150
	TELEPHONE AND INSTALLATION		214,422
	MAINTENANCE EQUIPMENT FOR CENTER		124,995
	TOTAL 1984.....		3,264,696
1985	WATER AND SEWERAGE CONNECTION		399.566
	MAINTENANCE EQUIPMENT		101.151
	OFFICE SUPPLY AND OPERATING COSTS		383,535
	ELECTRICITY		142,762
	TELEPHONE		259,799
	TOTAL 1985.....		1,286,813
1986	REPAIR AND MAINTENANCE OF CENTER		174,535
	WATER		106.372
	FUNCTIONING		153,100
	ELECTRICITY		205.950
	LAB EQUIPMENT		392,050
	TOTAL FIRST SEMESTER 1986.....		1,032.007
RECAPITULATION			
	1984:	CFA	3,264.696
	1985:		1,286.813
	1986 TO THIS DATE 07/02/86:		1.032.007
	T O T A L.....		5,583,516
	MONTHLY AVERAGE (26 MONTHS).....		214.751
	ANNUAL EQUIVALENT.....		2,577.007

Figure 2 : MEDICAL REGION BUDGET/RELATED SERVICES BUDGET
1985 - 1986

	CFA
KAOLACK MEDICAL REGION	
OPERATING COSTS	1,200,000
GASOLINE COSTS	2,232,000
PERMANENT COSTS	1,000,000
REGIONAL LABORATORY	
OPERATING COSTS	2,200,000
GASOLINE COSTS	558,000
PERMANENT COSTS	1,500,000
REGIONAL PMI (MOTHER AND CHILD CARE)	
OPERATING COSTS	2,850,000
KAOLACK MEDICAL DISTRICT	
OPERATING COSTS	2,644,000
GASOLINE COSTS	558,000
PERMANENT COSTS	1,700,000
HEALTH EDUCATION	
OPERATING COSTS	300,000
T O T A L	16,742,000

Figure 3 : RURAL HEALTH DS - AID
OPERATING COSTS - 1985

	Million CFA
1) SUPPLIES	1.5
2) SUPPORTING COSTS	34.6
3) TRAINING CENTER	0.3
4) LOCAL EQUIPMENT	20.0
5) VEHICLES	11.2
6) OFFICE	13.5
7) MISCELLANEOUS	0.2
T O T A L	81.3

Figure 4 : PROJECT OPERATING AND MAINTENANCE COSTS
(IN MILLIONS OF CFA)

	1977 - 12/80	1981	1982	1983	1984 (3 mos)
4.1 GOODS AND SERVICES					
GAS FOR VEHICLES	-	8.00	0.75	8.60	4.20
of which imported:		100%	100%	100%	100%
DRUGS	42.84	0.66	22.15	98.00	61.70
of which imported:	100%	100%	90%	90%	90%
PERMANENT COSTS (WATER, ELECTRICITY, TELEPHONE)	-	0.24	3.00	2.10	1.82
of which imported:					
GAS FOR MOBILETTES AND MAINTENANCE & SUPERVISION COSTS	-	23.82	23.40	4.00	0.88
of which imported:					
VEHICLE MAINTENANCE	-	4.80	7.65	8.15	0.10
of which imported:					
HORSES CARE	-	1.00	1.00	0.80	-
of which imported:					
BUILDING MAINTENANCE	-	-	25.00	22.00	5.02
of which imported:			40%	40%	40%
FINANCIAL COSTS	-	0.03	0.12	0.00	-
SUB-TOTAL 4.1	42.84	38.55	83.07	143.65	73.73
4.2 PERSONNEL CHARGES					
4.2(A) LOCAL PERSONNEL					
- SITE VISITS AND REFRESHER TRAINING	-	22.60	14.72	5.25	8.88
- SALARIES	23.78	25.20	28.53	31.20	33.87
- CHW REMUNERATION	-	-	-	-	-
4.2(B) EXPATRIATE PERSONNEL	3.41	49.13	46.75	49.85	15.76
SUBTOTAL 4.2	27.19	96.93	90.00	86.30	58.51
4.3 EQUIPMENT REPLACEMENT COSTS	-	-	-	-	-
SUBTOTAL 4.3	0.00	0.00	0.00	0.00	0.00
4.4 G R A N D T O T A L	70.03	135.47	173.08	229.95	132.24

A N N E X V I I

FINANCIAL ANALYSIS - EXHIBITS

ANNEX VII : FINANCIAL ANALYSIS - EXHIBITS

EXHIBIT 1

(1 of 1)

SINE SALOUM RURAL HEALTH [illegible] SERVICES PROJECT

SUMMARY OF LOCAL ACCOUNT EXPENDITURES FOR PHASE II

24 MONTHS: APRIL 1984 TO MARCH 1986

(C.F.A. FRANCS)

TRAINING:	Supplies		3,640,620	2.8%
	Per Diems		44,058,070	33.5%
	Labor		540,954	0.4%
	Overhead		117,268	0.1%
	Equipment		754,282	0.6%
	Subtotal	49,111,194		37.3%
VEHICLES:	Maintenance		2,701,466	2.1%
	Repairs		2,421,676	1.8%
	Parts		10,287,446	7.8%
	Mobylettes		1,756,845	1.3%
	Pirogues		808,340	0.6%
	Subtotal	17,975,773		13.7%
PROJECT OFFICE:	General Overhead		3,603,839	2.7%
	Maintenance		132,700	0.1%
	Contract Labor		2,951,981	2.2%
	Supplies		17,990,715	13.7%
	Salaries		13,729,236	10.4%
	Benefits		1,018,541	0.8%
	Per Diems		1,132,200	0.9%
	Equipment		22,519,458	17.1%
	Miscellaneous		1,339,543	1.0%
	Subtotal	64,418,213		49.0%
TOTAL LOCAL ACCOUNT		131,505,180		100.0%

SUMMARY

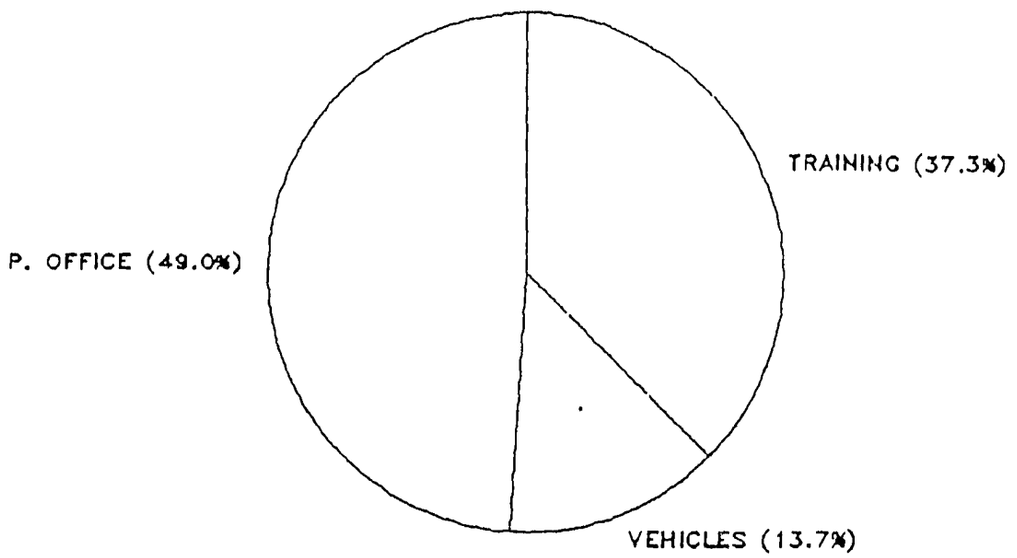
SUPPLIES	21,631,335	16.4%
PERSONNEL	14,747,777	11.2%
PER DIEMS	45,190,270	34.4%
CONTRACT LABOR	3,492,935	2.7%
VEHICLES	17,975,773	13.7%
EQUIPMENT	23,273,740	17.7%
GENERAL OVERHEAD	5,193,350	3.9%
	131,505,180	100.0%

EXHIBIT 2

(1 of 1)

SINE SALOUM RHDS PROJECT

LOCAL ACCOUNT EXPENDITURES SUMMARY



SINE SALOUM RHDS PROJECT

LOCAL ACCOUNT EXPENDITURES DETAIL

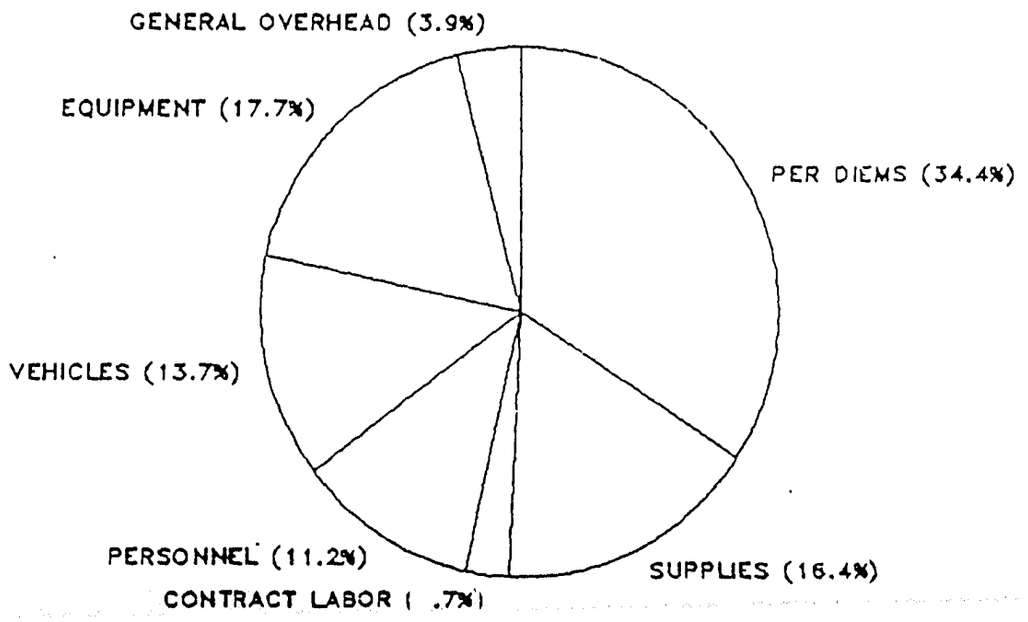


EXHIBIT 3

(1 of 1)

SINE SALOUM RURAL HEALTH DELIVERY SERVICES PROJECT

ACTUAL REPAIR, MAINTENANCE, FUEL USED AND KILOMETERS DRIVEN INFORMATION

DURING JANUARY TO DECEMBER, 1985

(IN C.F.A. FRANCS)

REG #	TYPE	AGE	PARTS	LABOR	P + L	MAINTENAN	TOTAL	KMS/YR	LTS FUEL	FUEL COST	TOTAL COST
5038 TTBI	Peugeot 504 (gasoline)	7	408,149	210,000	618,149	49,798	667,947	34,165	1,890	491,400	1,159,347
	TOTAL FOR 504	7	408,149	210,000	618,149	49,798	667,947	34,165	1,890	491,400	1,159,347
1047 TTBI	Peugeot 404 (diesel)	2	772,120	92,800	864,920	173,569	1,038,489	28,242	5,420	920,822	1,959,311
1048 TTBI	Peugeot 404 (diesel)	2	491,939	58,050	549,989	139,703	689,692	11,151	2,470	419,637	1,109,329
	TOTAL FOR 404 DIESEL		1,264,059	150,850	1,414,909	313,272	1,728,181	39,393	7,890	1,340,458	3,068,639
1658 TTBI	Peugeot 404 (gasoline)	1	407,704	13,000	420,704	75,890	496,594	17,358	1,100	286,000	782,594
1045 TTBI	Peugeot 404 (gasoline)	2	146,194	25,000	171,194	96,186	267,380	23,650	2,480	644,800	912,180
1049 TTBI	Peugeot 404 (gasoline)	2	137,674	6,500	144,174	93,623	237,797	28,300	4,210	1,094,600	1,332,397
0525 TTBI	Peugeot 404 (gasoline)	3	287,796	76,800	364,596	99,035	463,631	16,297	3,440	894,400	1,358,031
0526 TTBI	Peugeot 404 (gasoline)	3	409,548	61,000	470,548	42,815	513,363	30,865	1,610	418,600	931,963
0634 TTBI	Peugeot 404 (gasoline)	3	786,704	113,500	900,204	63,632	963,836	27,756	1,620	421,200	1,385,036
1174 TTAI	Peugeot 404 (gasoline)	3	111,183	0	111,183	18,177	129,360	12,876	990	257,400	386,760
	TOTAL FOR 404 GAS		2,286,803	295,800	2,582,603	489,358	3,071,961	157,092	15,450	4,017,000	7,088,961
1925 TTBI	R12 Break	1	59,008	31,000	90,008	73,310	163,318	21,965	2,890	751,400	914,718
1926 TTBI	R12 TL Break	1	69,082	0	69,082	60,668	129,750	21,218	2,250	585,000	714,750
8293 TTAI	R12 Break	3	272,248	90,000	362,248	91,115	453,363	28,975	2,770	720,200	1,173,563
8293 TTAI	R12 TL Break	5	419,467	55,060	474,527	28,648	503,175	28,717	1,520	395,200	898,375
	TOTAL FOR R12		819,805	176,060	995,865	253,741	1,249,606	100,875	9,430	2,451,800	3,701,406
1929 TTBI	R4 Fourgonette	1	124,312	22,000	146,312	103,341	249,653	13,608	1,520	395,200	644,853
1930 TTBI	R4 Fourgonette	1	189,380	28,000	217,380	68,804	286,184	23,031	3,030	787,800	1,073,984
1932 TTBI	R4 Fourgonette	1	236,681	36,000	272,681	97,828	370,509	23,256	1,770	460,200	830,709
8281 TTAI	R4 Fourgonette	5	213,323	0	213,323	23,062	236,385	10,138	880	228,800	465,185
	AVERAGE FOR R4		763,696	86,000	849,696	293,035	1,142,731	70,033	7,200	1,872,000	3,014,731
1990 TTBI	Traffic 15 seat (diesel)	1	25,514	14,000	39,514	96,558	136,072	8,877	1,360	231,055	357,127
1989 TTBI	Traffic fourgon (diesel)	1	112,474	47,173	159,647	130,311	289,958	18,024	4,290	728,842	1,018,800
	AVERAGE FOR TRAFFIC		137,988	61,173	199,161	216,869	416,030	26,901	5,650	959,897	1,375,927
TOTAL COST FOR 20 VEHICLES			5,272,351	769,383	6,042,234	1,566,275	7,608,509	394,294	45,620	10,641,156	18,249,665
Percent of total cost			29.9%	4.2%	33.1%	8.6%	41.7%			58.3%	100.0%

EXHIBIT 4

(1 of 1)

SINE SALOUM RURAL HEALTH DELIVERY SERVICES PROJECT

DETAIL OF AVERAGE VEHICLE COSTS

DURING JANUARY TO DECEMBER, 1985

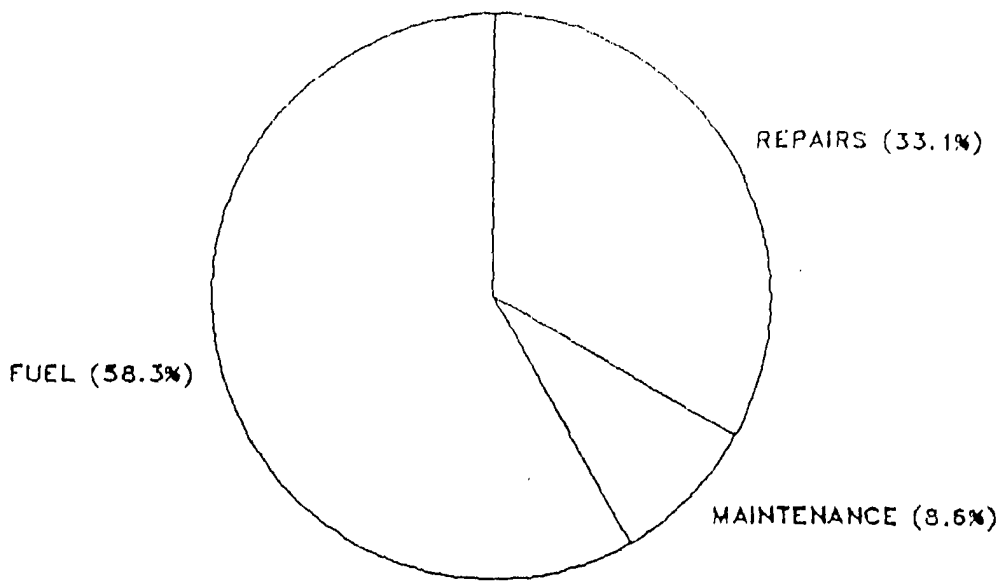
(IN C.F.A. FRANCS)

	PARTS	LABOR	P + L	MAINTEN	TOTAL	KMS/YR	LTS FUEL	FUEL COST	TOTAL COST
AVERAGE COST FOR 504									
7 yr. old (1)	408,149	210,000	618,149	49,798	667,947	34,165	1,890	491,400	1,159,347
AVERAGE COST FOR 404 DIESELS									
2 yr. olds (2)	632,030	75,425	707,455	156,636	864,091	19,697	3,945	670,229	1,534,320
AVERAGE COST FOR 404'S:									
1 yr. old gas (1)	407,704	13,000	420,704	75,390	496,594	17,358	1,100	286,000	782,594
2 yr. old gas (2)	141,934	15,750	157,684	94,905	252,589	25,975	3,345	869,700	1,122,289
3 yr. old gas (4)	398,808	62,825	461,633	55,915	517,548	21,946	1,915	497,900	1,015,448
Average all gas (7)	326,686	42,257	368,943	69,908	438,852	22,442	2,207	573,857	1,012,709
AVERAGE COST FOR R12'S:									
1 yr. old (2)	64,045	15,500	79,545	66,989	146,534	21,592	2,570	668,200	814,734
3 yr. old (1)	272,248	90,000	362,248	91,115	453,363	28,975	2,770	720,200	1,173,563
5 yr. old (1)	419,467	55,060	474,527	28,648	503,175	28,717	1,520	395,200	898,375
Average all (4)	204,951	44,015	248,966	63,435	312,402	25,219	2,358	612,950	925,352

EXHIBIT 5

1985 VEHICLE OPERATING COSTS

BY EXPENSE LINE ITEM



COMPARATIVE OPERATING COSTS

BY VEHICLE TYPE

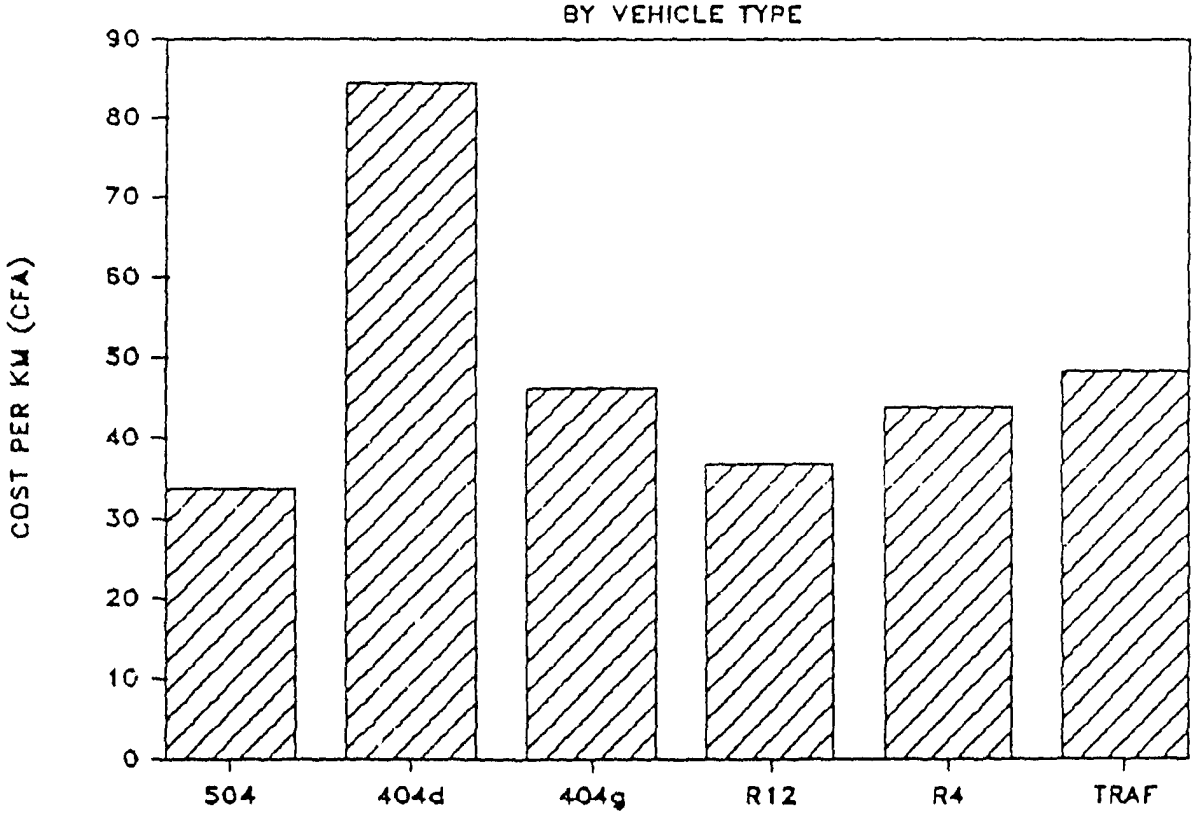


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EXHIBIT 6

(1 of 1)

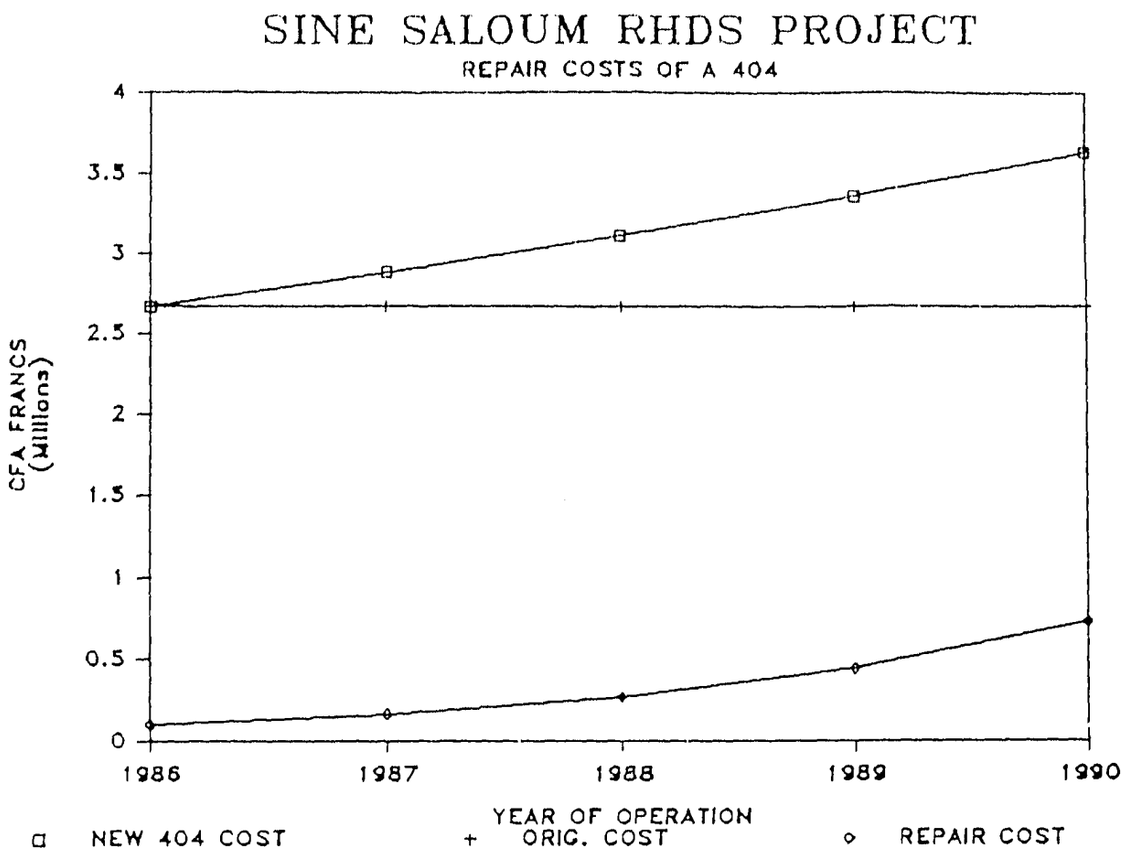

EXHIBIT 7

(1 of 3)

SINE SALOUM RURAL HEALTH DELIVERY SERVICES PROJECT

COMPOSITION OF VEHICLE FLEET BY TYPE AND AGE

ASSUMING CURRENT LEVELS WITH NO RETIREMENT OF VEHICLES

VEHICLE FLEET INFORMATION

	TOTAL VEHICLES:	1986	1987	1988	1989	1990
0	No. of new vehicles	0	4	2	1	0
1	No. of 1 yr old vehicles	1	0	4	2	1
2	No. of 2 yr old vehicles	2	1	0	4	2
3	No. of 3 yr old vehicles	4	2	1	0	4
4	No. of 4 yr old vehicles	0	0	0	0	0
5	No. of 5 yr old vehicles	0	0	0	0	0
	TOTAL 404's IN FLEET	7	7	7	7	7

VEHICLE FLEET INFORMATION

	TOTAL VEHICLES:	1986	1987	1988	1989	1990
0	No. of new vehicles	0	0	2	0	0
1	No. of 1 yr old vehicles	0	0	0	2	0
2	No. of 2 yr old vehicles	2	0	0	0	2
3	No. of 3 yr old vehicles	0	2	0	0	0
4	No. of 4 yr old vehicles	0	0	0	0	0
5	No. of 5 yr old vehicles	0	0	0	0	0
	TOTAL 404 DIESELS IN FLEET	2	2	2	2	2

VEHICLE FLEET INFORMATION

	TOTAL VEHICLES:	1986	1987	1988	1989	1990
0	No. of new vehicles	0	1	1	4	0
1	No. of 1 yr old vehicles	4	0	1	1	4
2	No. of 2 yr old vehicles	1	4	0	1	1
3	No. of 3 yr old vehicles	1	1	4	0	1
4	No. of 4 yr old vehicles	0	0	0	0	0
5	No. of 5 yr old vehicles	0	0	0	0	0
	TOTAL R12'S IN FLEET	6	6	6	6	6

EXHIBIT 7

(2 of 3)

SINE SALOUM RURAL HEALTH DELIVERY SERVICES PROJECT

COMPOSITION OF VEHICLE FLEET BY TYPE AND AGE

ASSUMING CURRENT LEVELS WITH NO RETIREMENT OF VEHICLES

VEHICLE FLEET INFORMATION

	TOTAL VEHICLES:	1986	1987	1988	1989	1990
0	No. of new vehicles	0	1	0	3	0
1	No. of 1 yr old vehicles	3	0	1	0	3
2	No. of 2 yr old vehicles	0	3	0	1	0
3	No. of 3 yr old vehicles	1	0	3	0	1
4	No. of 4 yr old vehicles	0	0	0	0	0
5	No. of 5 yr old vehicles	0	0	0	0	0
TOTAL R4'S IN FLEET		4	4	4	4	4

VEHICLE FLEET INFORMATION

	TOTAL VEHICLES:	1986	1987	1988	1989	1990
0	No. of new vehicles	0	0	0	2	0
1	No. of 1 yr old vehicles	2	0	0	0	2
2	No. of 2 yr old vehicles	0	2	0	0	0
3	No. of 3 yr old vehicles	0	0	2	0	0
4	No. of 4 yr old vehicles	0	0	0	0	0
5	No. of 5 yr old vehicles	0	0	0	0	0
TOTAL RENAULT TRAFFIC DIESELS IN FLEET		2	2	2	2	2

VEHICLE FLEET INFORMATION

	TOTAL VEHICLES:	1986	1987	1988	1989	1990
0	No. of new vehicles	1	0	0	0	1
1	No. of 1 yr old vehicles	0	1	0	0	0
2	No. of 2 yr old vehicles	0	0	1	0	0
3	No. of 3 yr old vehicles	0	0	0	1	0
4	No. of 4 yr old vehicles	0	0	0	0	0
5	No. of 5 yr old vehicles	0	0	0	0	0
TOTAL 505's IN FLEET		1	1	1	1	1

EXHIBIT 7

(3 of 3)

SINE SALOUM RURAL HEALTH DELIVERY SERVICES PROJECT

COMPOSITION OF VEHICLE FLEET BY TYPE AND AGE

ASSUMING CURRENT LEVELS WITH NO RETIREMENT OF VEHICLES

	TOTAL VEHICLES:	1986	1987	1988	1989	1990
0	No. of new vehicles	1	6	5	10	1
1	No. of 1 yr old vehicles	10	1	6	5	10
2	No. of 2 yr old vehicles	5	10	1	6	5
3	No. of 3 yr old vehicles	6	5	10	1	6
4	No. of 4 yr old vehicles	0	0	0	0	0
5	No. of 5 yr old vehicles	0	0	0	0	0
TOTAL VEHICLES IN FLEET		22	22	22	22	22
WEIGHTED AVERAGE AGE OF THE VEHICLE FLEET		1.7	1.6	1.7	0.9	1.7

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EXHIBIT 8

(1 of 12)

SINE SALOUM RURAL HEALTH DELIVERY SERVICES PROJECT

ESTIMATED VEHICLE OPERATING AND REPLACEMENT COSTS

ASSUMPTIONS FOR A NEW VEHICLE:	AVERAGE	1986	1987	1988	1989	1990
*** PEUGEOT 505 ***		1	2	3	4	5
Vehicle replacement cost	4,600,000	4,600,000	4,968,000	5,365,440	5,794,675	6,258,249
General cost escalation factor	8.0%	100.0	108.0	116.6	126.0	136.0
Average vehicle life left in kms.	136,000	102,000	68,000	34,000	0	0
Average vehicle usage in kms/yr	34,000	34,000	34,000	34,000	34,000	34,000
Vehicle repair escalation index	100	100	164	270	444	729
Average repair cost in 1st yr.	400,000	400,000	657,213	1,079,822	1,774,182	2,915,037
Repairs as a % of original cost		8.7%	14.3%	23.5%	38.6%	63.4%
Repairs as a % of replacement cost		8.7%	13.2%	20.1%	30.6%	46.6%
Repair escalation factor (1+r)3rd.	18.0%					
Average maintenance cost	50,000	50,000	54,000	58,320	62,986	68,024
Fuel cost per liter (CFA)	260					
Average vehicle fuel use km/lt	10.1					
Fuel cost per year	871,339	871,339	914,905	960,651	1,008,683	1,059,117
Insurance cost per year	106,645	106,645	111,977	117,576	123,455	129,629
Taxes & Registration per year	20,000	20,000	21,600	23,328	25,194	27,210
Fuel consumption escalation factor	5.0%					
Average vehicle life in yrs/no	4.0					
Vehicle replacement sinking fund	1,564,562	1,564,562	1,564,562	1,564,562	1,564,562	0
Sinking fund cumulative balance		1,564,562	3,129,125	4,693,687	6,258,249	6,258,249

SUMMARY OF PEUGEOT 505 OPERATING COSTS

Fuel	871,339	914,905	960,651	1,008,683	1,059,117
Repairs and Maintenance	450,000	711,213	1,138,142	1,937,167	2,983,061
Insurance and Registration	126,645	133,577	140,904	148,649	156,637
TOTAL YEARLY COSTS PER VEHICLE	1,447,984	1,759,696	2,239,697	2,994,500	4,199,016

VEHICLE FLEET INFORMATION

	ORIGINAL VEHICLES:	START:	1986	1987	1988	1989	1990
0	No. of new vehicles		0				
1	No. of 1 yr old vehicles		0	0			
2	No. of 2 yr old vehicles		0	0	0		
3	No. of 3 yr old vehicles		0	0	0	0	
4	No. of 4 yr old vehicles	1	0	0	0	0	0
5	No. of 5 yr old vehicles		0	0	0	0	0
TOTAL ORIGINAL 505's IN FLEET		1	0	0	0	0	0
DESIRED NUMBER OF VEHICLES IN FLEET		1	1	1	1	1	1

EXHIBIT 8

(2 of 12)

SINE SALOUM RURAL HEALTH DELIVERY SERVICES PROJECT

ESTIMATED VEHICLE OPERATING AND REPLACEMENT COSTS

	REPLACEMENT VEHICLES: START:		1986	1987	1988	1989	1990
0	No. of new vehicles		1	0	0	0	1
1	No. of 1 yr old vehicles		0	1	0	0	0
2	No. of 2 yr old vehicles		0	0	1	0	0
3	No. of 3 yr old vehicles		0	0	0	1	0
4	No. of 4 yr old vehicles		0	0	0	0	0
5	No. of 5 yr old vehicles		0	0	0	0	0
TOTAL REPLACEMENT VEHICLES		0	1	1	1	1	1
TOTAL VEHICLES IN FLEET		1	1	1	1	1	1
TOTAL COST OF REPLACEMENT VEHICLES			4,600,000	0	0	0	6,258,249

VEHICLE FLEET INFORMATION

	TOTAL VEHICLES:	1986	1987	1988	1989	1990
0	No. of new vehicles	1	0	0	0	1
1	No. of 1 yr old vehicles	0	1	0	0	0
2	No. of 2 yr old vehicles	0	0	1	0	0
3	No. of 3 yr old vehicles	0	0	0	1	0
4	No. of 4 yr old vehicles	0	0	0	0	0
5	No. of 5 yr old vehicles	0	0	0	0	0
TOTAL 505's IN FLEET		1	1	1	1	1

VEHICLE FLEET REPAIR COSTS

	ALL VEHICLES:		1986	1987	1988	1989	1990
0	New vehicles		400,000	0	0	0	544,196
1	1 yr old vehicles		0	657,213	0	0	0
2	2 yr old vehicles		0	0	1,079,822	0	0
3	3 yr old vehicles		0	0	0	1,774,182	0
4	4 yr old vehicles		0	0	0	0	0
5	5 yr old vehicles						
TOTAL REPAIR COSTS		0	400,000	657,213	1,079,822	1,774,182	544,196

FINAL SUMMARY OF PEUGEOT 505 COSTS	1986	1987	1988	1989	1990
Fuel	871,339	914,905	960,651	1,008,683	871,339
Repairs and Maintenance	450,000	711,213	1,138,142	1,837,167	612,220
Insurance and Registration	126,645	133,577	140,904	148,649	156,837
Purchase of Replacement Vehicles	4,600,000	0	0	0	6,258,249
TOTAL YEARLY OUTLAYS FOR ALL 505'S	6,047,984	1,759,696	2,239,697	2,994,500	7,898,645

EXHIBIT 8

(3 of 12)

SINE SALOUM RURAL HEALTH DELIVERY SERVICES PROJECT

ESTIMATED VEHICLE OPERATING AND REPLACEMENT COSTS

ASSUMPTIONS FOR A NEW VEHICLE:	AVERAGE	1986	1987	1988	1989	1990
*** PEUGEOT 404 DIESEL ***		1	2	3	4	5
Vehicle replacement cost	3,067,500	3,067,500	3,312,900	3,577,932	3,864,167	4,173,300
General cost escalation factor	8.0%	100.0	108.0	116.6	126.0	136.0
Average vehicle life left in kms.	80,000	60,000	40,000	20,000	0	0
Average vehicle usage in kms/yr	20,000	20,000	20,000	20,000	20,000	20,000
Vehicle repair escalation index	100	100	164	270	444	729
Average repair cost in 1st yr.	300,000	300,000	492,910	809,866	1,330,636	2,186,278
Repairs as a % of original cost		9.8%	16.1%	26.4%	43.4%	71.3%
Repairs as a % of replacement cost		9.8%	14.9%	22.6%	34.4%	52.4%
Repair escalation factor (1+r)3rd.	18.0%					
Average maintenance cost	157,000	157,000	169,560	183,125	197,775	213,597
Fuel cost per liter (CFA)	170					
Average vehicle fuel use km/lt	5.1					
Fuel cost per year	670,260	670,260	703,773	738,962	775,910	814,706
Insurance cost per year	180,586	180,586	189,615	199,096	209,051	219,503
Taxes & Registration per year	20,000	20,000	21,600	23,328	25,194	27,210
Fuel consumption escalation factor	5.0%					
Average vehicle life in yrs/mo	4.0					
Vehicle replacement sinking fund	1,043,325	1,043,325	1,043,325	1,043,325	1,043,325	0
Sinking fund cumulative balance		1,043,325	2,086,650	3,129,975	4,173,300	4,173,300

SUMMARY OF PEUGEOT 404 DIESEL OPERATING COSTS

Fuel	670,260	703,773	738,962	775,910	814,706
Repairs and Maintenance	457,000	662,470	992,991	1,528,411	2,399,875
Insurance and Registration	200,586	211,215	222,424	234,245	246,713
TOTAL YEARLY COSTS PER VEHICLE	1,327,846	1,577,458	1,954,377	2,538,566	3,461,293

VEHICLE FLEET INFORMATION

	ORIGINAL VEHICLES:	START:	1986	1987	1988	1989	1990
0	No. of new vehicles		0				
1	No. of 1 yr old vehicles		0	0			
2	No. of 2 yr old vehicles	2	2	0	0		
3	No. of 3 yr old vehicles		0	2	0	0	
4	No. of 4 yr old vehicles		0	0	0	0	0
5	No. of 5 yr old vehicles		0	0	0	0	0
TOTAL ORIGINAL 404 DIESELS		2	2	2	0	0	0
DESIRED NUMBER OF VEHICLES IN FLEET		2	2	2	2	2	2

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EXHIBIT 8

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SINE SALOUM RURAL HEALTH DELIVERY SERVICES PROJECT

ESTIMATED VEHICLE OPERATING AND REPLACEMENT COSTS

	REPLACEMENT VEHICLES:	START:	1986	1987	1988	1989	1990
0	No. of new vehicles		0	0	2	0	0
1	No. of 1 yr old vehicles		0	0	0	2	0
2	No. of 2 yr old vehicles		0	0	0	0	2
3	No. of 3 yr old vehicles		0	0	0	0	0
4	No. of 4 yr old vehicles		0	0	0	0	0
5	No. of 5 yr old vehicles		0	0	0	0	0
	TOTAL REPLACEMENT VEHICLES	0	0	0	2	2	2
	TOTAL VEHICLES IN FLEET	2	2	2	2	2	2
	TOTAL COST OF REPLACEMENT VEHICLES		0	0	7,155,864	0	0

VEHICLE FLEET INFORMATION

	TOTAL VEHICLES:	1986	1987	1988	1989	1990
0	No. of new vehicles	0	0	2	0	0
1	No. of 1 yr old vehicles	0	0	0	2	0
2	No. of 2 yr old vehicles	2	0	0	0	2
3	No. of 3 yr old vehicles	0	2	0	0	0
4	No. of 4 yr old vehicles	0	0	0	0	0
5	No. of 5 yr old vehicles	0	0	0	0	0
	TOTAL 404 DIESELS IN FLEET	2	2	2	2	2

VEHICLE FLEET REPAIR COSTS

	ALL VEHICLES:	1986	1987	1988	1989	1990
0	New vehicles	0	0	699,840	0	0
1	1 yr old vehicles	0	0	0	1,149,860	0
2	2 yr old vehicles	1,388,660	0	0	0	1,889,256
3	3 yr old vehicles	0	2,281,612	0	0	0
4	4 yr old vehicles	0	0	0	0	0
5	5 yr old vehicles					
	TOTAL REPAIR COSTS	0 1,388,660	2,281,612	699,840	1,149,860	1,889,256

FINAL SUMMARY OF PEUGEOT 404 DIESEL COSTS	1986	1987	1988	1989	1990
Fuel	1,477,924	1,551,820	1,340,521	1,407,547	1,477,924
Repairs and Maintenance	1,702,660	2,620,732	1,066,090	1,545,409	2,316,450
Insurance and Registration	401,172	422,431	444,848	468,490	493,426
Purchase of Replacement Vehicles	0	0	7,155,864	0	0
TOTAL YEARLY OUTLAYS FOR ALL 404 DIESELS	3,581,756	4,594,983	10,007,323	3,421,446	4,287,800

EXHIBIT 8

(5 of 12)

SINE SALOUM RURAL HEALTH DELIVERY SERVICES PROJECT

ESTIMATED VEHICLE OPERATING AND REPLACEMENT COSTS

ASSUMPTIONS FOR A NEW VEHICLE:	AVERAGE	1986	1987	1988	1989	1990
*** PEUGEOT 404 ***		1	2	3	4	5
Vehicle replacement cost	2,667,500	2,667,500	2,880,900	3,111,372	3,360,282	3,629,104
General cost escalation factor	8.0%	100.0	108.0	116.6	126.0	136.0
Average vehicle life left in kms.	90,000	67,500	45,000	22,500	0	0
Average vehicle usage in kms/yr	22,500	22,500	22,500	22,500	22,500	22,500
Vehicle repair escalation index	100	100	164	270	444	729
Average repair cost in 1st yr.	100,000	100,000	164,303	269,955	443,545	728,759
Repairs as a % of original cost		3.7%	6.2%	10.1%	16.6%	27.3%
Repairs as a % of replacement cost		3.7%	5.7%	8.7%	13.2%	20.1%
Repair escalation factor (1st/3rd.	18.0%					
Average maintenance cost	75,000	75,000	81,000	87,480	94,478	102,037
Fuel cost per liter (CFA)	260					
Average vehicle fuel use km/lt	10.1					
Fuel cost per year	576,621	576,621	605,452	635,725	667,511	700,887
Insurance cost per year	180,586	180,586	189,615	199,096	209,051	219,503
Taxes & Registration per year	20,000	20,000	21,600	23,328	25,194	27,210
Fuel consumption escalation factor	5.0%					
Average vehicle life in yrs/mo	4.0					
Vehicle replacement sinking fund	907,276	907,276	907,276	907,276	907,276	0
Sinking fund cumulative balance		907,276	1,814,552	2,721,828	3,629,104	3,629,104

SUMMARY OF PEUGEOT 404 OPERATING COSTS

Fuel	576,621	605,452	635,725	667,511	700,887
Repairs and Maintenance	175,000	245,303	357,435	538,024	830,796
Insurance and Registration	200,586	211,215	222,424	234,245	246,713
TOTAL YEARLY COSTS PER VEHICLE	952,207	1,061,971	1,215,584	1,439,780	1,778,396

VEHICLE FLEET INFORMATION

	ORIGINAL VEHICLES:	START:	1986	1987	1988	1989	1990
0	No. of new vehicles		0				
1	No. of 1 yr old vehicles	1	1	0			
2	No. of 2 yr old vehicles	2	2	1	0		
3	No. of 3 yr old vehicles	4	4	2	1	0	
4	No. of 4 yr old vehicles		0	0	0	0	0
5	No. of 5 yr old vehicles		0	0	0	0	0
TOTAL ORIGINAL 404's IN FLEET		7	7	3	1	0	0
DESIRED NUMBER OF VEHICLES IN FLEET		7	7	7	7	7	7

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EXHIBIT 8

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SINE SALOUM RURAL HEALTH DELIVERY SERVICES PROJECT

ESTIMATED VEHICLE OPERATING AND REPLACEMENT COSTS

	REPLACEMENT VEHICLES:	START:	1986	1987	1988	1989	1990
0	No. of new vehicles		0	4	2	1	0
1	No. of 1 yr old vehicles		0	0	4	2	1
2	No. of 2 yr old vehicles		0	0	0	4	2
3	No. of 3 yr old vehicles		0	0	0	0	4
4	No. of 4 yr old vehicles		0	0	0	0	0
5	No. of 5 yr old vehicles		0	0	0	0	0
	TOTAL REPLACEMENT VEHICLES	0	0	4	6	7	7
	TOTAL VEHICLES IN FLEET	7	7	7	7	7	7
	TOTAL COST OF REPLACEMENT VEHICLES		0	11,523,600	6,222,744	3,360,282	0

VEHICLE FLEET INFORMATION

	TOTAL VEHICLES:	1986	1987	1988	1989	1990
0	No. of new vehicles	0	4	2	1	0
1	No. of 1 yr old vehicles	1	0	4	2	1
2	No. of 2 yr old vehicles	2	1	0	4	2
3	No. of 3 yr old vehicles	4	2	1	0	4
4	No. of 4 yr old vehicles	0	0	0	0	0
5	No. of 5 yr old vehicles	0	0	0	0	0
	TOTAL 404's IN FLEET	7	7	7	7	7

VEHICLE FLEET REPAIR COSTS

	ALL VEHICLES:	1986	1987	1988	1989	1990
0	New vehicles	0	432,000	233,280	125,971	0
1	1 yr old vehicles	152,133	0	709,790	383,287	206,975
2	2 yr old vehicles	462,887	249,959	0	1,166,207	629,752
3	3 yr old vehicles	1,408,403	760,537	410,690	0	1,916,116
4	4 yr old vehicles	0	0	0	0	0
5	5 yr old vehicles					
	TOTAL REPAIR COSTS	0 2,023,422	1,442,496	1,353,760	1,675,465	2,752,843

FINAL SUMMARY OF PEUGEOT 404 COSTS	1986	1987	1988	1989	1990
Fuel	4,546,946	4,277,231	4,242,562	4,330,424	4,546,946
Repairs and Maintenance	2,548,422	2,009,496	1,966,120	2,336,814	3,467,099
Insurance and Registration	1,404,102	1,478,507	1,556,968	1,639,716	1,726,992
Purchase of Replacement Vehicles	0	11,523,600	6,222,744	3,360,282	0
TOTAL YEARLY OUTLAYS FOR ALL 404'S	8,499,469	19,288,834	13,988,394	11,667,236	9,741,037

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EXHIBIT 8

(7 of 12)

SINE SALOUM RURAL HEALTH DELIVERY SERVICES PROJECT

ESTIMATED VEHICLE OPERATING AND REPLACEMENT COSTS

ASSUMPTIONS FOR A NEW VEHICLE:	AVERAGE	1986	1987	1988	1989	1990
*** RENAULT R12 ***		1	2	3	4	5
Vehicle replacement cost	2,300,000	2,300,000	2,484,000	2,682,720	2,897,338	3,129,125
General cost escalation factor	8.0%	100.0	108.0	116.6	126.0	136.0
Average vehicle life left in kms.	100,000	75,000	50,000	25,000	0	0
Average vehicle usage in kms/yr	25,000	25,000	25,000	25,000	25,000	25,000
Vehicle repair escalation index	100	100	164	270	444	729
Average repair cost in 1st yr.	112,000	112,000	184,020	302,350	496,771	816,210
Repairs as a % of original cost		4.9%	8.0%	13.1%	21.6%	35.5%
Repairs as a % of replacement cost		4.9%	7.4%	11.3%	17.1%	26.1%
Repair escalation factor (1+r)3rd.	18.0%					
Average maintenance cost	64,000	64,000	69,120	74,650	80,622	87,071
Fuel cost per liter (CFA)	260					
Average vehicle fuel use km/lt	10.6					
Fuel cost per year	615,063	615,063	645,816	678,106	712,012	747,612
Insurance cost per year	130,668	130,668	137,201	144,061	151,265	158,828
Taxes & Registration per year	20,000	20,000	21,600	23,328	25,194	27,210
Fuel consumption escalation factor	5.0%					
Average vehicle life in yrs/ao	4.0					
Vehicle replacement sinking fund	782,281	782,281	782,281	782,281	782,281	0
Sinking fund cumulative balance		782,281	1,564,562	2,346,843	3,129,125	3,129,125

SUMMARY OF RENAULT R12 OPERATING COSTS

Fuel	615,063	645,816	678,106	712,012	747,612
Repairs and Maintenance	176,000	253,140	377,000	577,392	903,282
Insurance and Registration	150,668	158,801	167,389	176,459	186,038
TOTAL YEARLY COSTS PER VEHICLE	941,731	1,057,757	1,222,496	1,465,863	1,836,932

VEHICLE FLEET INFORMATION

	ORIGINAL VEHICLES:	START:	1986	1987	1988	1989	1990
0	No. of new vehicles		0				
1	No. of 1 yr old vehicles	4	4	0			
2	No. of 2 yr old vehicles	1	1	4	0		
3	No. of 3 yr old vehicles	1	1	1	4	0	
4	No. of 4 yr old vehicles		0	0	0	0	0
5	No. of 5 yr old vehicles		0	0	0	0	0
TOTAL ORIGINAL R12'S IN FLEET		6	6	5	4	0	0
DESIRED NUMBER OF VEHICLES IN FLEET		6	6	6	6	6	6

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EXHIBIT 8

(8 of 12)

SINE SALOUM RURAL HEALTH DELIVERY SERVICES PROJECT

ESTIMATED VEHICLE OPERATING AND REPLACEMENT COSTS

	REPLACEMENT VEHICLES:	START:	1986	1987	1988	1989	1990
0	No. of new vehicles		0	1	1	4	0
1	No. of 1 yr old vehicles		0	0	1	1	4
2	No. of 2 yr old vehicles		0	0	0	1	1
3	No. of 3 yr old vehicles		0	0	0	0	1
4	No. of 4 yr old vehicles		0	0	0	0	0
5	No. of 5 yr old vehicles		0	0	0	0	0
TOTAL REPLACEMENT VEHICLES		0	0	1	2	6	6
TOTAL VEHICLES IN FLEET		6	6	6	6	6	6
TOTAL COST OF REPLACEMENT VEHICLES			0	2,484,000	2,682,720	11,589,350	0

VEHICLE FLEET INFORMATION

	TOTAL VEHICLES:	1986	1987	1988	1989	1990
0	No. of new vehicles	0	1	1	4	0
1	No. of 1 yr old vehicles	4	0	1	1	4
2	No. of 2 yr old vehicles	1	4	0	1	1
3	No. of 3 yr old vehicles	1	1	4	0	1
4	No. of 4 yr old vehicles	0	0	0	0	0
5	No. of 5 yr old vehicles	0	0	0	0	0
TOTAL R12'S IN FLEET		6	6	6	6	6

VEHICLE FLEET REPAIR COSTS

	ALL VEHICLES:	1986	1987	1988	1989	1990
0	New vehicles	0	120,960	130,637	564,351	0
1	1 yr old vehicles	681,554	0	198,741	214,640	927,247
2	2 yr old vehicles	259,216	1,119,815	0	326,538	352,661
3	3 yr old vehicles	394,353	425,901	1,839,892	0	536,512
4	4 yr old vehicles	0	0	0	0	0
5	5 yr old vehicles					
TOTAL REPAIR COSTS		0 1,335,123	1,666,676	2,169,270	1,105,529	1,816,420

FINAL SUMMARY OF RENAULT R12 COSTS	1986	1987	1988	1989	1990
Fuel	3,973,381	4,039,500	4,108,925	3,784,172	3,973,381
Repairs and Maintenance	1,719,123	2,081,396	2,617,168	1,589,259	2,338,848
Insurance and Registration	904,008	952,808	1,004,337	1,058,753	1,116,225
Purchase of Replacement Vehicles	0	2,484,000	2,682,720	11,589,350	0

EXHIBIT 8

(9 of 12)

SINE SALOUM RURAL HEALTH DELIVERY SERVICES PROJECT

ESTIMATED VEHICLE OPERATING AND REPLACEMENT COSTS

ASSUMPTIONS FOR A NEW VEHICLE:	AVERAGE	1986	1987	1988	1989	1990
*** RENAULT R4 ***		1	2	3	4	5
Vehicle replacement cost	2,300,000	2,300,000	2,484,000	2,682,720	2,897,338	3,129,125
General cost escalation factor	8.0%	100.0	108.0	116.6	126.0	136.0
Average vehicle life left in kms.	72,000	54,000	36,000	18,000	0	0
Average vehicle usage in kms/yr	18,000	18,000	18,000	18,000	18,000	18,000
Vehicle repair escalation index	100	100	164	270	444	729
Average repair cost in 1st yr.	213,000	213,000	349,966	575,005	944,752	1,552,257
Repairs as a % of original cost		9.3%	15.2%	25.0%	41.1%	67.5%
Repairs as a % of replacement cost		9.3%	14.1%	21.4%	32.6%	49.6%
Repair escalation factor (1+r)3rd.	18.0%					
Average maintenance cost	73,000	73,000	78,840	85,147	91,959	99,316
Fuel cost per liter (CFA)	260					
Average vehicle fuel use km/lt	9.7					
Fuel cost per year	481,353	481,353	505,421	530,692	557,227	585,088
Insurance cost per year	92,215	92,215	96,826	101,667	106,750	112,088
Taxes & Registration per year	20,000	20,000	21,600	23,328	25,194	27,210
Fuel consumption escalation factor	5.0%					
Average vehicle life in yrs/mo	4.0					
Vehicle replacement sinking fund	782,281	782,281	782,281	782,281	782,281	0
Sinking fund cumulative balance		782,281	1,564,562	2,346,843	3,129,125	3,129,125

SUMMARY OF RENAULT R4 OPERATING COSTS

Fuel	481,353	505,421	530,692	557,227	585,088
Repairs and Maintenance	286,000	428,806	660,152	1,036,711	1,651,573
Insurance and Registration	112,215	118,426	124,995	131,945	139,298
TOTAL YEARLY COSTS PER VEHICLE	879,568	1,052,652	1,315,839	1,725,882	2,375,959

VEHICLE FLEET INFORMATION

	ORIGINAL VEHICLES:	START:	1986	1987	1988	1989	1990
0	No. of new vehicles		0				
1	No. of 1 yr old vehicles	3	3	0			
2	No. of 2 yr old vehicles		0	3	0		
3	No. of 3 yr old vehicles	1	1	0	3	0	
4	No. of 4 yr old vehicles		0	0	0	0	0
5	No. of 5 yr old vehicles		0	0	0	0	0
TOTAL ORIGINAL R4'S IN FLEET		4	4	3	3	0	0
DESIRED NUMBER OF VEHICLES IN FLEET		4	4	4	4	4	4

EXHIBIT 8

(10 of 12)

SINE SALOUM RURAL HEALTH DELIVERY SERVICES PROJECT

ESTIMATED VEHICLE OPERATING AND REPLACEMENT COSTS

	REPLACEMENT VEHICLES: START:	1986	1987	1988	1989	1990
0	No. of new vehicles	0	1	0	3	0
1	No. of 1 yr old vehicles	0	0	1	0	3
2	No. of 2 yr old vehicles	0	0	0	1	0
3	No. of 3 yr old vehicles	0	0	0	0	1
4	No. of 4 yr old vehicles	0	0	0	0	0
5	No. of 5 yr old vehicles	0	0	0	0	0
	TOTAL REPLACEMENT VEHICLES 0	0	1	1	4	4
	TOTAL VEHICLES IN FLEET 4	4	4	4	4	4
	TOTAL COST OF REPLACEMENT VEHICLES	0	2,484,000	0	8,692,013	0

VEHICLE FLEET INFORMATION

	TOTAL VEHICLES:	1986	1987	1988	1989	1990
0	No. of new vehicles	0	1	0	3	0
1	No. of 1 yr old vehicles	3	0	1	0	3
2	No. of 2 yr old vehicles	0	3	0	1	0
3	No. of 3 yr old vehicles	1	0	3	0	1
4	No. of 4 yr old vehicles	0	0	0	0	0
5	No. of 5 yr old vehicles	0	0	0	0	0
	TOTAL R4'S IN FLEET	4	4	4	4	4

VEHICLE FLEET REPAIR COSTS

	ALL VEHICLES:	1986	1987	1988	1989	1990
0	New vehicles	0	253,040	0	804,956	0
1	1 yr old vehicles	972,127	0	377,963	0	1,322,568
2	2 yr old vehicles	0	1,597,236	0	621,005	0
3	3 yr old vehicles	749,974	0	2,624,310	0	1,020,332
4	4 yr old vehicles	0	0	0	0	0
5	5 yr old vehicles					
	TOTAL REPAIR COSTS 0	1,722,102	27,276	3,002,273	1,425,961	2,342,900

FINAL SUMMARY OF RENAULT R4 COSTS	1986	1987	1988	1989	1990
Fuel	2,073,489	2,073,489	2,177,101	1,974,752	2,073,489
Repairs and Maintenance	2,014,102	2,142,636	3,342,862	1,793,797	2,740,163
Insurance and Registration	448,860	473,703	499,980	527,779	557,191
Purchase of Replacement Vehicles	0	2,484,000	0	8,692,013	0

EXHIBIT 8

(11 of 12)

SINE SALOUM RURAL HEALTH DELIVERY SERVICES PROJECT

ESTIMATED VEHICLE OPERATING AND REPLACEMENT COSTS

ASSUMPTIONS FOR A NEW VEHICLE:	AVERAGE	1986	1987	1988	1989	1990
*** RENAULT TRAFFIC DIESEL ***		1	2	3	4	5
Vehicle replacement cost	5,702,950	5,702,950	6,159,186	6,651,921	7,184,075	7,758,801
General cost escalation factor	8.0%	100.0	108.0	116.6	126.0	136.0
Average vehicle life left in kms.	60,000	60,000	40,000	20,000	0	0
Average vehicle usage in kms/yr	20,000	20,000	20,000	20,000	20,000	20,000
Vehicle repair escalation index	100	100	164	270	444	729
Average repair cost in 1st yr.	100,000	100,000	164,303	269,955	443,545	728,759
Repairs as a % of original cost		1.8%	2.9%	4.7%	7.8%	12.8%
Repairs as a % of replacement cost		1.8%	2.7%	4.1%	6.2%	9.4%
Repair escalation factor (1+r)3rd. r =	18.0%					
Average maintenance cost	109,000	109,000	117,720	127,138	137,309	148,293
Fuel cost per liter (CFA)	170					
Average vehicle fuel use km/lt	6.3					
Fuel cost per year	536,208	536,208	563,019	591,170	620,728	651,765
Insurance cost per year	352,637	352,637	370,269	388,782	408,221	428,632
Taxes & Registration per year	20,000	20,000	21,600	23,328	25,194	27,210
Fuel consumption escalation factor	5.0%					
Average vehicle life in yrs/mo	4.0					
Vehicle replacement sinking fund	1,939,700	1,939,700	1,939,700	1,939,700	1,939,700	0
Sinking fund cumulative balance		1,939,700	3,879,400	5,819,100	7,758,801	7,758,801

SUMMARY OF RENAULT TRAFFIC DIESEL OPERATING COSTS

Fuel	536,208	563,019	591,170	620,728	651,765
Repairs and Maintenance	209,000	282,023	397,093	580,854	877,053
Insurance and Registration	372,637	391,869	412,110	433,416	455,842
TOTAL YEARLY COSTS PER VEHICLE	1,117,845	1,236,911	1,400,373	1,634,998	1,984,659

VEHICLE FLEET INFORMATION

	ORIGINAL VEHICLES:	START:	1986	1987	1988	1989	1990
0	No. of new vehicles		0				
1	No. of 1 yr old vehicles	2	2	0			
2	No. of 2 yr old vehicles		0	2	0		
3	No. of 3 yr old vehicles		0	0	2	0	
4	No. of 4 yr old vehicles		0	0	0	0	0
5	No. of 5 yr old vehicles		0	0	0	0	0
TOTAL RENAULT TRAFFIC DIESELS		2	2	2	2	0	0
DESIRED NUMBER OF VEHICLES IN FLEET		2	2	2	2	2	2

EXHIBIT 8

(12 of 12)

SINE SALOUM RURAL HEALTH DELIVERY SERVICES PROJECT

ESTIMATED VEHICLE OPERATING AND REPLACEMENT COSTS

Renault Traffic Diesel Page 2

	REPLACEMENT VEHICLES: START:		1986	1987	1988	1989	1990
0	No. of new vehicles		0	0	0	2	0
1	No. of 1 yr old vehicles		0	0	0	0	2
2	No. of 2 yr old vehicles		0	0	0	0	0
3	No. of 3 yr old vehicles		0	0	0	0	0
4	No. of 4 yr old vehicles		0	0	0	0	0
5	No. of 5 yr old vehicles		0	0	0	0	0
TOTAL REPLACEMENT VEHICLES		0	0	0	0	2	2
TOTAL VEHICLES IN FLEET		2	2	2	2	2	2
TOTAL COST OF REPLACEMENT VEHICLES			0	0	0	14,368,149	0

VEHICLE FLEET INFORMATION

	TOTAL VEHICLES:	1986	1987	1988	1989	1990
0	No. of new vehicles	0	0	0	2	0
1	No. of 1 yr old vehicles	2	0	0	0	2
2	No. of 2 yr old vehicles	0	2	0	0	0
3	No. of 3 yr old vehicles	0	0	2	0	0
4	No. of 4 yr old vehicles	0	0	0	0	0
5	No. of 5 yr old vehicles	0	0	0	0	0
TOTAL RENAULT TRAFFIC DIESELS IN FLEET		2	2	2	2	2

VEHICLE FLEET REPAIR COSTS

	ALL VEHICLES:	1986	1987	1988	1989	1990
0	New vehicles	0	0	0	251,942	0
1	1 yr old vehicles	304,265	0	0	0	413,949
2	2 yr old vehicles	0	499,917	0	0	0
3	3 yr old vehicles	0	0	821,380	0	0
4	4 yr old vehicles	0	0	0	0	0
5	5 yr old vehicles					
TOTAL REPAIR COSTS		0 304,265	499,917	821,380	251,942	413,949

FINAL SUMMARY OF RENAULT TRAFFIC DIESEL COSTS	1986	1987	1988	1989	1990
Fuel	1,126,038	1,182,339	1,241,456	1,072,417	1,126,038
Repairs and Maintenance	522,265	735,357	1,075,656	526,560	710,536
Insurance and Registration	745,274	783,738	824,221	866,831	911,685
Purchase of Replacement Vehicles	0	0	0	14,368,149	0
TOTAL YEARLY OUTLAYS FOR ALL TRAFFIC DIESELS	2,393,577	2,701,435	3,141,332	16,833,957	2,748,258

EXHIBIT 9

(1 of 3)

SINE SALOUM RURAL HEALTH DELIVERY SERVICES PROJECT

ESTIMATED VEHICLE OPERATING AND REPLACEMENT COSTS

SUMMARY BY VEHICLE TYPE

ASSUMING CURRENT LEVELS WITH NO RETIREMENT OF VEHICLES

(C.F.A)

FINAL SUMMARY OF PEUGEOT 505 COSTS	1986	1987	1988	1989	1990
Fuel	871,339	914,905	960,651	1,008,683	871,339
Repairs and Maintenance	450,000	711,213	1,138,142	1,837,167	612,220
Insurance and Registration	126,645	133,577	140,904	148,649	156,837
Purchase of Replacement Vehicles	4,600,000	0	0	0	6,258,249
TOTAL YEARLY OUTLAYS FOR ALL 505'S	6,047,984	1,759,696	2,239,697	2,994,500	7,898,645

FINAL SUMMARY OF PEUGEOT 404 DIESEL COSTS	1986	1987	1988	1989	1990
Fuel	1,477,924	1,551,820	1,340,521	1,407,547	1,477,924
Repairs and Maintenance	1,702,660	2,620,732	1,066,090	1,545,409	2,216,450
Insurance and Registration	401,172	422,431	444,848	468,490	493,426
Purchase of Replacement Vehicles	0	0	7,155,864	0	0
TOTAL YEARLY OUTLAYS FOR ALL 404 DIESELS	3,581,756	4,594,983	10,007,323	3,421,446	4,297,800

FINAL SUMMARY OF PEUGEOT 404 COSTS	1986	1987	1988	1989	1990
Fuel	4,546,946	4,277,231	4,242,562	4,330,424	4,546,946
Repairs and Maintenance	2,548,422	2,009,496	1,966,120	2,336,814	3,467,099
Insurance and Registration	1,404,102	1,478,507	1,556,968	1,639,716	1,726,992
Purchase of Replacement Vehicles	0	11,523,600	6,222,744	3,360,262	0
TOTAL YEARLY OUTLAYS FOR ALL 404'S	8,499,469	19,288,834	13,988,394	11,667,236	9,741,037

EXHIBIT 9

(2 of 3)

SINE SALOUM RURAL HEALTH DELIVERY SERVICES PROJECT

ESTIMATED VEHICLE OPERATING AND REPLACEMENT COSTS

SUMMARY BY VEHICLE TYPE

ASSUMING CURRENT LEVELS WITH NO RETIREMENT OF VEHICLES

(C.F.A)

FINAL SUMMARY OF RENAULT R12 COSTS	1986	1987	1988	1989	1990
Fuel	3,973,381	4,039,500	4,108,925	3,784,172	3,973,381
Repairs and Maintenance	1,719,123	2,081,396	2,617,168	1,589,259	2,338,848
Insurance and Registration	904,008	952,808	1,004,337	1,058,753	1,116,225
Purchase of Replacement Vehicles	0	2,484,000	2,682,720	11,589,350	0
TOTAL YEARLY OUTLAYS FOR ALL R12'S	6,596,512	9,557,704	10,413,149	18,021,534	7,428,454

FINAL SUMMARY OF RENAULT R4 COSTS	1986	1987	1988	1989	1990
Fuel	2,073,489	2,073,429	2,177,101	1,974,752	2,073,489
Repairs and Maintenance	2,014,102	2,142,636	3,342,862	1,793,797	2,740,163
Insurance and Registration	448,860	473,703	499,980	527,779	557,191
Purchase of Replacement Vehicles	0	2,484,000	0	8,692,013	0
TOTAL YEARLY OUTLAYS FOR ALL R4'S	4,536,451	7,173,768	6,019,943	12,988,340	5,370,843

FINAL SUMMARY OF RENAULT TRAFFIC DIESEL COSTS	1986	1987	1988	1989	1990
Fuel	1,126,038	1,182,339	1,241,456	1,072,417	1,126,038
Repairs and Maintenance	522,265	735,357	1,075,656	526,560	710,536
Insurance and Registration	745,274	783,738	824,221	866,831	911,685
Purchase of Replacement Vehicles	0	0	0	14,368,149	0
TOTAL YEARLY OUTLAYS FOR ALL TRAFFIC DIESELS	2,393,577	2,701,435	3,141,332	16,833,957	2,748,258

EXHIBIT 9

(3 of 3)

SINE SALOUM RURAL HEALTH DELIVERY SERVICES PROJECT

ESTIMATED VEHICLE OPERATING AND REPLACEMENT COSTS

SUMMARY BY VEHICLE TYPE

ASSUMING CURRENT LEVELS WITH NO RETIREMENT OF VEHICLES

(C.F.A)

FINAL SUMMARY OF VEHICLE COSTS	1986	1987	1988	1989	1990
Fuel	14,069,116	14,039,225	14,071,215	13,577,995	14,069,116
Repairs and Maintenance	8,956,571	10,300,831	11,206,036	9,629,006	12,185,316
TOTAL VARIABLE OPERATING COSTS	23,025,687	24,340,056	25,277,252	23,207,001	26,254,432
Insurance and Registration	4,030,061	4,244,764	4,471,258	4,710,218	4,962,357
TOTAL YEARLY OPERATING COSTS	27,055,748	28,584,820	29,748,510	27,917,219	31,216,789
Purchase of Replacement Vehicles	4,600,000	16,491,600	16,061,328	38,009,794	6,258,249
TOTAL YEARLY OUTLAYS FOR ALL VEHICLES	31,655,748	45,076,420	45,809,838	65,927,013	37,475,038

EXHIBIT 10

(1 of 1)

SINE SALOUM RURAL HEALTH DELIVERY SERVICES PROJECT

CURRENT DISTRIBUTION OF THE MOTOR VEHICLE FLEET

AS OF MAY 31, 1986

VEH #	REG #	TYPE	LOCATION	PHASE	DISPOSITION
1	1047 TTBI	Peugeot 404 (diesel)	Kaolack Project Office	I	permanent
2	1048 TTBI	Peugeot 404 (diesel)	Kasnack Medical Center (Kaolack)	I	permanent
3	0525 TTBI	Peugeot 404 (gas)	Nioro Medical Center	I	permanent
4	0526 TTBI	Peugeot 404 (gas)	Koungheul Medical Center	I	permanent
5	0634 TTBI	Peugeot 404 (gas)	Sokone Medical Center	I	permanent
6	1045 TTBI	Peugeot 404 (gas)	Gossas Medical Center	I	permanent
7	1049 TTBI	Peugeot 404 (gas)	Kaffrine Medical Center	II	permanent
8	1658 TTBI	Peugeot 404 (gas)	Foundiougne Medical Center	II	permanent
9	3116 TTBI	Peugeot 404 (gas)	Fatick Medical Center	II	permanent
10	5038 TTBI	Peugeot 504 (gas)	Kaolack Project Office	I	retire
11	0533 TTBI	R12 Break	Project Office-Coordinator-Kaolack	I	retire
12	0701 TTBI	R12 Break	DHPS	II	retire
13	1925 TTBI	R12 Break	Kaolack Region Supervision	II	permanent
14	1927 TTBI	R12 Break	Director, Training Center	II	retire
15	1926 TTBI	R12 TL Break	Fatick Region Supervision	II	permanent
16	8293 TTAI	R12 TL Break	Grands Endemies Supervision	I	retire
17	1929 TTBI	R4 Fourgonette	Social Development - Kaffrine	II	retire
18	1930 TTBI	R4 Fourgonette	Social Development - Kongheul	II	retire
19	1932 TTBI	R4 Fourgonette	Social Development - Fatick	II	retire
20	8291 TTAI	R4 Fourgonette	Kaolack Project Office	I	retire
21	1990 TTBI	Renault Traf 15 seat	Training Center	II	permanent
22	1989 TTBI	Renault Traf Fourgon	Regional Pharmacy	II	permanent

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EXHIBIT 11

(1 of 3)

SINE SALOOM RURAL HEALTH DELIVERY SERVICES PROJECT

COMPOSITION OF VEHICLE FLEET BY TYPE AND AGE

ASSUMING GRADUAL PHASE-OUT OF NON-ESSENTIAL VEHICLES

(PAGE 1)

VEHICLE FLEET INFORMATION

	TOTAL VEHICLES:	1986	1987	1988	1989	1990
0	No. of new vehicles	0	4	4	1	0
1	No. of 1 yr old vehicles	1	0	4	4	1
2	No. of 2 yr old vehicles	2	1	0	4	4
3	No. of 3 yr old vehicles	4	2	1	0	4
4	No. of 4 yr old vehicles	0	0	0	0	0
5	No. of 5 yr old vehicles	0	0	0	0	0
TOTAL 404's IN FLEET		7	7	9	9	9

VEHICLE FLEET INFORMATION

	TOTAL VEHICLES:	1986	1987	1988	1989	1990
0	No. of new vehicles	0	0	0	0	0
1	No. of 1 yr old vehicles	0	0	0	0	0
2	No. of 2 yr old vehicles	2	0	0	0	0
3	No. of 3 yr old vehicles	0	2	0	0	0
4	No. of 4 yr old vehicles	0	0	0	0	0
5	No. of 5 yr old vehicles	0	0	0	0	0
TOTAL 404 DIESELS IN FLEET		2	2	0	0	0

VEHICLE FLEET INFORMATION

	TOTAL VEHICLES:	1986	1987	1988	1989	1990
0	No. of new vehicles	0	0	0	2	0
1	No. of 1 yr old vehicles	4	0	0	0	2
2	No. of 2 yr old vehicles	1	4	0	0	0
3	No. of 3 yr old vehicles	1	1	4	0	0
4	No. of 4 yr old vehicles	0	0	0	0	0
5	No. of 5 yr old vehicles	0	0	0	0	0
TOTAL 812 S IN FLEET		6	5	4	2	2

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EXHIBIT 11

(2 OF 3)

SINE SALOUM RURAL HEALTH DELIVERY SERVICES PROJECT

COMPOSITION OF VEHICLE FLEET BY TYPE AND AGE

ASSUMING GRADUAL PHASE-OUT OF NON-ESSENTIAL VEHICLES

VEHICLE FLEET INFORMATION

	TOTAL VEHICLES:	1986	1987	1988	1989	1990
0	No. of new vehicles	0	0	0	0	0
1	No. of 1 yr old vehicles	3	0	0	0	0
2	No. of 2 yr old vehicles	0	3	0	0	0
3	No. of 3 yr old vehicles	1	0	3	0	0
4	No. of 4 yr old vehicles	0	0	0	0	0
5	No. of 5 yr old vehicles	0	0	0	0	0
	TOTAL R4'S IN FLEET	4	3	3	0	0

VEHICLE FLEET INFORMATION

	TOTAL VEHICLES:	1986	1987	1988	1989	1990
0	No. of new vehicles	0	0	0	2	0
1	No. of 1 yr old vehicles	2	0	0	0	2
2	No. of 2 yr old vehicles	0	2	0	0	0
3	No. of 3 yr old vehicles	0	0	2	0	0
4	No. of 4 yr old vehicles	0	0	0	0	0
5	No. of 5 yr old vehicles	0	0	0	0	0
	TOTAL RENAULT TRAFFIC DIESELS IN FLEET	2	2	2	2	2

VEHICLE FLEET INFORMATION

	TOTAL VEHICLES:	1986	1987	1988	1989	1990
0	No. of new vehicles	0	0	0	0	0
1	No. of 1 yr old vehicles	0	0	0	0	0
2	No. of 2 yr old vehicles	0	0	0	0	0
3	No. of 3 yr old vehicles	0	0	0	0	0
4	No. of 4 yr old vehicles	0	0	0	0	0
5	No. of 5 yr old vehicles	0	0	0	0	0
	TOTAL 505's IN FLEET	0	0	0	0	0

EXHIBIT 11

(3 of 5)

SINE SALOUM RURAL HEALTH DELIVERY SERVICES PROJECT

COMPOSITION OF VEHICLE FLEET BY TYPE AND AGE

ASSUMING GRADUAL PHASE-OUT OF NON-ESSENTIAL VEHICLES

	[illegible] VEHICLES	1986	1987	1988	1989	1990
0	No. of new vehicles	0	4	4	5	0
1	No. of 1 yr old vehicles	10	0	4	4	5
2	No. of 2 yr old vehicles	5	10	0	4	4
3	No. of 3 yr old vehicles	6	5	10	0	4
4	No. of 4 yr old vehicles	0	0	0	0	0
5	No. of 5 yr old vehicles	0	0	0	0	0
TOTAL VEHICLES IN FLEET		21	19	18	13	13
WEIGHTED AVERAGE AGE OF THE VEHICLE FLEET		1.8	1.8	1.9	0.9	1.9

EXHIBIT 12

(1 of 10)

SINE SALOUM RURAL HEALTH DELIVERY SERVICES PROJECT

ESTIMATED VEHICLE OPERATING AND REPLACEMENT COSTS

ASSUMPTIONS FOR A NEW VEHICLE:	AVERAGE	1986	1987	1988	1989	1990
*** PEUGEOT 404 DIESEL ***		1	2	3	4	5
Vehicle replacement cost	3,067,500	3,067,500	3,312,900	3,577,932	3,864,167	4,173,300
General cost escalation factor	8.0%	100.0	108.0	116.6	126.0	136.0
Average vehicle life left in kms.	80,000	60,000	40,000	20,000	0	0
Average vehicle usage in kms/yr	20,000	20,000	20,000	20,000	20,000	20,000
Vehicle repair escalation index	100	100	164	270	444	729
Average repair cost in 1st yr.	300,000	300,000	492,910	809,866	1,330,636	2,186,278
Repairs as a % of original cost		9.8%	16.1%	26.4%	43.4%	71.3%
Repairs as a % of replacement cost		9.8%	14.9%	22.6%	34.4%	52.4%
Repair escalation factor (1+r)3rd.	18.0%					
Average maintenance cost	157,000	157,000	169,560	183,125	197,775	213,597
Fuel cost per liter (CFA)	170					
Average vehicle fuel use km/lt .	5.1					
Fuel cost per year	670,260	670,260	703,773	738,962	775,910	814,706
Insurance cost per year	180,586	180,586	189,615	199,096	209,051	219,503
Taxes & Registration per year	20,000	20,000	21,600	23,328	25,194	27,210
Fuel consumption escalation factor	5.0%					
Average vehicle life in yrs/mo	4.0					
Vehicle replacement sinking fund	1,043,325	1,043,325	1,043,325	1,043,325	1,043,325	0
Sinking fund cumulative balance		1,043,325	2,086,650	3,129,975	4,173,300	4,173,300

SUMMARY OF PEUGEOT 404 DIESEL OPERATING COSTS

Fuel	670,260	703,773	738,962	775,910	814,706
Repairs and Maintenance	457,000	662,470	992,991	1,528,411	2,399,875
Insurance and Registration	200,586	211,215	222,424	234,245	246,713
TOTAL YEARLY COSTS PER VEHICLE	1,327,846	1,577,458	1,954,377	2,538,566	3,461,293

VEHICLE FLEET INFORMATION

	ORIGINAL VEHICLES:	START:	1986	1987	1988	1989	1990
0	No. of new vehicles		0				
1	No. of 1 yr old vehicles		0	0			
2	No. of 2 yr old vehicles	2	2	0	0		
3	No. of 3 yr old vehicles		0	2	0	0	
4	No. of 4 yr old vehicles		0	0	0	0	0
5	No. of 5 yr old vehicles		0	0	0	0	0
TOTAL ORIGINAL 404 DIESELS		2	2	2	0	0	0
DESIRED NUMBER OF VEHICLES IN FLEET		2	2	2	0	0	0

EXHIBIT 12

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SINE SALOUM RURAL HEALTH DELIVERY SERVICES PROJECT

ESTIMATED VEHICLE OPERATING AND REPLACEMENT COSTS

	REPLACEMENT VEHICLES: START:	1986	1987	1988	1989	1990
0	No. of new vehicles	0	0	0	0	0
1	No. of 1 yr old vehicles	0	0	0	0	0
2	No. of 2 yr old vehicles	0	0	0	0	0
3	No. of 3 yr old vehicles	0	0	0	0	0
4	No. of 4 yr old vehicles	0	0	0	0	0
5	No. of 5 yr old vehicles	0	0	0	0	0
	TOTAL REPLACEMENT VEHICLES 0	0	0	0	0	0
	TOTAL VEHICLES IN FLEET 2	2	2	0	0	0
	TOTAL COST OF REPLACEMENT VEHICLES	0	0	0	0	0

VEHICLE FLEET INFORMATION

	TOTAL VEHICLES:	1986	1987	1988	1989	1990
0	No. of new vehicles	0	0	0	0	0
1	No. of 1 yr old vehicles	0	0	0	0	0
2	No. of 2 yr old vehicles	2	0	0	0	0
3	No. of 3 yr old vehicles	0	2	0	0	0
4	No. of 4 yr old vehicles	0	0	0	0	0
5	No. of 5 yr old vehicles	0	0	0	0	0
	TOTAL 404 DIESELS IN FLEET	2	2	0	0	0

VEHICLE FLEET REPAIR COSTS

	ALL VEHICLES:	1986	1987	1988	1989	1990
0	New vehicles	0	0	0	0	0
1	1 yr old vehicles	0	0	0	0	0
2	2 yr old vehicles	1,388,660	0	0	0	0
3	3 yr old vehicles	0	2,281,612	0	0	0
4	4 yr old vehicles	0	0	0	0	0
5	5 yr old vehicles					
	TOTAL REPAIR COSTS 0	1,388,660	2,281,612	0	0	0

FINAL SUMMARY OF PEUGEOT 404 DIESEL COSTS	1986	1987	1988	1989	1990
Fuel	1,477,924	1,551,820	0	0	0
Repairs and Maintenance	1,702,660	2,620,732	0	0	0
Insurance and Registration	401,172	422,431	0	0	0
Purchase of Replacement Vehicles	0	0	0	0	0
TOTAL YEARLY OUTLAYS FOR ALL 404 DIESELS	3,581,756	4,594,983	0	0	0

EXHIBIT 12

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SINE SALOUM RURAL HEALTH DELIVERY SERVICES PROJECT

ESTIMATED VEHICLE OPERATING AND REPLACEMENT COSTS

ASSUMPTIONS FOR A NEW VEHICLE:	AVERAGE	1986	1987	1988	1989	1990
*** PEUGEOT 404 ***		1	2	3	4	5
Vehicle replacement cost	2,667,500	2,667,500	2,880,900	3,111,372	3,360,282	3,629,104
General cost escalation factor	8.0%	100.0	108.0	116.6	126.0	136.0
Average vehicle life left in kms.	90,000	67,500	45,000	22,500	0	0
Average vehicle usage in kms/yr	22,500	22,500	22,500	22,500	22,500	22,500
Vehicle repair escalation index	100	100	164	270	444	729
Average repair cost in 1st yr.	100,000	100,000	164,303	269,955	443,545	728,759
Repairs as a % of original cost		3.7%	6.2%	10.1%	16.6%	27.3%
Repairs as a % of replacement cost		3.7%	5.7%	8.7%	13.2%	20.1%
Repair escalation factor (1st)3rd.	18.0%					
Average maintenance cost	75,000	75,000	81,000	87,480	94,478	102,037
Fuel cost per liter (CFA)	260					
Average vehicle fuel use km/lt	10.1					
Fuel cost per year	576,621	576,621	605,452	635,725	667,511	700,887
Insurance cost per year	180,586	180,586	189,615	199,096	209,051	219,503
Taxes & Registration per year	20,000	20,000	21,600	23,328	25,194	27,210
Fuel consumption escalation factor	5.0%					
Average vehicle life in yrs/ao	4.0					
Vehicle replacement sinking fund	907,276	907,276	907,276	907,276	907,276	0
Sinking fund cumulative balance		907,276	1,814,552	2,721,828	3,629,104	3,629,104

SUMMARY OF PEUGEOT 404 OPERATING COSTS

Fuel	576,621	605,452	635,725	667,511	700,887
Repairs and Maintenance	175,000	245,303	357,435	538,024	830,796
Insurance and Registration	200,586	211,215	222,424	234,245	246,713
TOTAL YEARLY COSTS PER VEHICLE	952,207	1,061,971	1,215,584	1,439,780	1,778,396

VEHICLE FLEET INFORMATION

	ORIGINAL VEHICLES:	START:	1986	1987	1988	1989	1990
0	No. of new vehicles		0				
1	No. of 1 yr old vehicles	1	1	0			
2	No. of 2 yr old vehicles	2	2	1	0		
3	No. of 3 yr old vehicles	4	4	2	1	0	
4	No. of 4 yr old vehicles		0	0	0	0	0
5	No. of 5 yr old vehicles		0	0	0	0	0
TOTAL ORIGINAL 404's IN FLEET		7	7	3	1	0	0
DESIRED NUMBER OF VEHICLES IN FLEET		7	7	7	9	9	9

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SINE SALOUM RURAL HEALTH DELIVERY SERVICES PROJECT

ESTIMATED VEHICLE OPERATING AND REPLACEMENT COSTS

Peugeot 404 Page 2

	REPLACEMENT VEHICLES: START:	1986	1987	1988	1989	1990
0	No. of new vehicles	0	4	4	1	0
1	No. of 1 yr old vehicles	0	0	4	4	1
2	No. of 2 yr old vehicles	0	0	0	4	4
3	No. of 3 yr old vehicles	0	0	0	0	4
4	No. of 4 yr old vehicles	0	0	0	0	0
5	No. of 5 yr old vehicles	0	0	0	0	0
TOTAL REPLACEMENT VEHICLES	0	0	4	8	9	9
TOTAL VEHICLES IN FLEET	7	7	7	9	9	9
TOTAL COST OF REPLACEMENT VEHICLES		0	11,523,600	12,445,488	3,360,282	0

VEHICLE FLEET INFORMATION

	TOTAL VEHICLES:	1986	1987	1988	1989	1990
0	No. of new vehicles	0	4	4	1	0
1	No. of 1 yr old vehicles	1	0	4	4	1
2	No. of 2 yr old vehicles	2	1	0	4	4
3	No. of 3 yr old vehicles	4	2	1	0	4
4	No. of 4 yr old vehicles	0	0	0	0	0
5	No. of 5 yr old vehicles	0	0	0	0	0
TOTAL 404's IN FLEET		7	7	9	9	9

VEHICLE FLEET REPAIR COSTS

	ALL VEHICLES:	1986	1987	1988	1989	1990
0	New vehicles	0	432,000	466,560	125,971	0
1	1 yr old vehicles	152,133	0	709,790	766,573	206,975
2	2 yr old vehicles	462,887	249,959	0	1,166,207	1,259,504
3	3 yr old vehicles	1,408,403	760,537	410,690	0	1,916,116
4	4 yr old vehicles	0	0	0	0	0
5	5 yr old vehicles					
TOTAL REPAIR COSTS	0	2,023,423	1,442,496	1,587,040	2,058,752	3,382,595

FINAL SUMMARY OF PEUGEOT 404 COSTS	1986	1987	1988	1989	1990
Fuel	4,546,946	4,277,231	5,395,804	5,541,329	5,818,395
Repairs and Maintenance	2,548,422	2,009,496	2,374,360	2,909,057	4,300,925
Insurance and Registration	1,404,102	1,478,507	2,001,817	2,108,206	2,220,419
Purchase of Replacement Vehicles	0	11,523,600	12,445,488	3,360,282	0
TOTAL YEARLY OUTLAYS FOR ALL 404'S	8,499,469	19,288,834	22,217,469	13,918,874	12,339,739

EXHIBIT 12

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SINE SALOUM [illegible] SERVICES PROJECT

ESTIMATED VEHICLE OPERATING AND REPLACEMENT COSTS

ASSUMPTIONS FOR A NEW VEHICLE:	AVERAGE	1986	1987	1988	1989	1990
*** RENAULT R12 ***		1	2	3	4	5
Vehicle replacement cost	2,500,000	2,500,000	2,484,000	2,462,720	2,427,238	3,129,125
General cost escalation factor	8.0%	100.0	108.0	116.6	126.0	136.0
Average vehicle life left in yrs.	100.00%	25,000	50,000	25,000	0	0
Average vehicle usage in yrs/yr	25,000	25,000	25,000	25,000	25,000	25,000
Vehicle repair escalation index	100	100	164	270	444	729
Average repair cost in 1st yr.	112,000	112,000	184,020	302,350	496,771	816,210
Repairs as a % of original cost		4.5%	8.0%	13.1%	21.6%	35.5%
Repairs as a % of replacement cost		4.5%	7.4%	11.3%	17.1%	26.1%
Repair escalation factor (1+r)3rd.	18.0%					
Average maintenance cost	64,000	64,000	69,120	74,650	80,622	87,071
Fuel cost per liter (CFA)	250					
Average vehicle fuel use km/lt	10.6					
Fuel cost per year	615,063	615,063	645,816	678,106	712,012	747,612
Insurance cost per year	130,668	130,668	137,201	144,061	151,265	158,828
Taxes & Registration per year	20,000	20,000	21,600	23,328	25,194	27,210
Fuel consumption escalation factor	5.0%					
Average vehicle life in yrs/mo	4.0					
Vehicle replacement sinking fund	782,281	782,281	782,281	782,281	782,281	0
Sinking fund cumulative balance		782,281	1,564,562	2,346,843	3,129,125	3,129,125

SUMMARY OF RENAULT R12 OPERATING COSTS

Fuel	615,063	645,816	678,106	712,012	747,612
Repairs and Maintenance	176,000	253,140	377,000	577,392	903,282
Insurance and Registration	150,668	158,801	167,389	176,459	186,038
TOTAL YEARLY COSTS PER VEHICLE	941,731	1,057,757	1,222,496	1,465,863	1,836,932

VEHICLE FLEET INFORMATION

	ORIGINAL VEHICLES:	START:	1986	1987	1988	1989	1990
0	No. of new vehicles		0				
1	No. of 1 yr old vehicles	4	4	0			
2	No. of 2 yr old vehicles	1	1	4	0		
3	No. of 3 yr old vehicles	1	1	1	4	0	
4	No. of 4 yr old vehicles		0	0	0	0	0
5	No. of 5 yr old vehicles		0	0	0	0	0
TOTAL ORIGINAL R12'S IN FLEET		6	6	5	4	0	0
DESIRED NUMBER OF VEHICLES IN FLEET		6	6	5	4	2	2

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EXHIBIT 12

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SINE SALOUM RURAL HEALTH DELIVERY SERVICES PROJECT

ESTIMATED VEHICLE OPERATING AND REPLACEMENT COSTS

Renault R12 Type 2

	REPLACEMENT VEHICLES: START:	1986	1987	1988	1989	1990
0	No. of new vehicles	0	0	0	2	0
1	No. of 1 yr old vehicles	0	0	0	0	2
2	No. of 2 yr old vehicles	0	0	0	0	0
3	No. of 3 yr old vehicles	0	0	0	0	0
4	No. of 4 yr old vehicles	0	0	0	0	0
5	No. of 5 yr old vehicles	0	0	0	0	0
	TOTAL REPLACEMENT VEHICLES	0	0	0	0	2	2
	TOTAL VEHICLES IN FLEET	6	6	5	4	2	2
	TOTAL COST OF REPLACEMENT VEHICLES		0	0	0	5,794,675	0

VEHICLE FLEET INFORMATION

	TOTAL VEHICLES:	1986	1987	1988	1989	1990
0	No. of new vehicles	0	0	0	2	0
1	No. of 1 yr old vehicles	4	0	0	0	2
2	No. of 2 yr old vehicles	1	4	0	0	0
3	No. of 3 yr old vehicles	1	1	4	0	0
4	No. of 4 yr old vehicles	0	0	0	0	0
5	No. of 5 yr old vehicles	0	0	0	0	0
	TOTAL R12'S IN FLEET	6	5	4	2	2

VEHICLE FLEET REPAIR COSTS

	ALL VEHICLES:	1986	1987	1988	1989	1990
0	New vehicles	0	0	0	292,175	0
1	1 yr old vehicles	681,554	0	0	0	463,623
2	2 yr old vehicles	259,216	1,119,815	0	0	0
3	3 yr old vehicles	394,353	425,901	1,839,892	0	0
4	4 yr old vehicles	0	0	0	0	0
5	5 yr old vehicles					
	TOTAL REPAIR COSTS	0 1,335,123	1,545,716	1,839,892	282,175	463,623

FINAL SUMMARY OF RENAULT R12 COSTS	1986	1987	1988	1989	1990
Fuel	3,973,381	3,424,437	2,848,047	1,230,125	1,291,631
Repairs and Maintenance	1,719,123	1,891,316	2,138,490	443,419	637,766
Insurance and Registration	904,008	794,007	669,558	352,918	372,075
Purchase of Replacement Vehicles	0	0	0	5,794,675	0
TOTAL YEARLY OUTLAYS FOR ALL R12'S	6,596,512	6,109,760	5,656,095	7,821,136	2,301,472

[illegible]

[illegible]

ASSUMPTIONS FOR A NEW VEHICLE:	AVERAGE	1986	1987	1988	1989	1990
*** RENAULT R4 ***		1	2	3	4	5
Vehicle replacement cost	2,300,000	2,300,000	2,484,000	2,682,720	2,897,338	3,129,125
General cost escalation factor	8.0%	100.0	108.0	116.6	126.0	136.0
Average vehicle life left in kms.	72,000	54,000	36,000	18,000	0	0
Average vehicle usage in kms/yr	18,000	18,000	18,000	18,000	18,000	18,000
Vehicle repair escalation index	100	100	164	270	444	729
Average repair cost in 1st yr.	213,000	213,000	349,966	575,005	944,752	1,552,257
Repairs as a % of original cost		9.3%	15.2%	25.0%	41.1%	67.5%
Repairs as a % of replacement cost		9.3%	14.1%	21.4%	32.6%	49.6%
Repair escalation factor (1+r)^3rd.	18.0%					
Average maintenance cost	73,000	73,000	78,840	85,147	91,959	99,316
Fuel cost per liter (CFA)	260					
Average vehicle fuel use km/lt	9.7					
Fuel cost per year	481,353	481,353	505,421	530,692	557,227	585,088
Insurance cost per year	92,215	92,215	96,826	101,667	106,750	112,088
Taxes & Registration per year	20,000	20,000	21,600	23,328	25,194	27,210
Fuel consumption escalation factor	5.0%					
Average vehicle life in yrs/mo	4.0					
Vehicle replacement sinking fund	782,281	782,281	782,281	782,281	782,281	0
Sinking fund cumulative balance		782,281	1,564,562	2,346,843	3,129,125	3,129,125

SUMMARY OF RENAULT R4 OPERATING COSTS

	1986	1987	1988	1989	1990
Fuel	481,353	505,421	530,692	557,227	585,088
Repairs and Maintenance	286,000	428,306	660,152	1,036,711	1,651,573
Insurance and Registration	112,215	118,426	124,995	131,945	139,298
TOTAL YEARLY COSTS PER VEHICLE	879,568	1,052,652	1,315,839	1,725,882	2,375,959

VEHICLE FLEET INFORMATION

	ORIGINAL VEHICLES:	START:	1986	1987	1988	1989	1990
0	No. of new vehicles		0				
1	No. of 1 yr old vehicles	3	3	0			
2	No. of 2 yr old vehicles		0	3	0		
3	No. of 3 yr old vehicles	1	1	0	3	0	
4	No. of 4 yr old vehicles		0	0	0	0	0
5	No. of 5 yr old vehicles		0	0	0	0	0
	TOTAL ORIGINAL R4'S IN FLEET	4	4	3	3	0	0
	DESIRED NUMBER OF VEHICLES IN FLEET	4	4	3	3	0	0

EXHIBIT 12

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SINE SALOOM 4060 HEALTH DELIVERY SERVICES PROJECT

ESTIMATED VEHICLE OPERATING AND REPLACEMENT COSTS

Renault R4 Type F

	REPLACEMENT VEHICLES:	START:	1986	1987	1988	1989	1990
0	No. of new vehicles		0	0	0	0	0
1	No. of 1 yr old vehicles		0	0	0	0	0
2	No. of 2 yr old vehicles		0	0	0	0	0
3	No. of 3 yr old vehicles		0	0	0	0	0
4	No. of 4 yr old vehicles		0	0	0	0	0
5	No. of 5 yr old vehicles		0	0	0	0	0
	TOTAL REPLACEMENT VEHICLES	0	0	0	0	0	0
	TOTAL VEHICLES IN FLEET	4	4	3	3	0	0
	TOTAL COST OF REPLACEMENT VEHICLES		0	0	0	0	0

VEHICLE FLEET INFORMATION

	TOTAL VEHICLES:	1986	1987	1988	1989	1990
0	No. of new vehicles	0	0	0	0	0
1	No. of 1 yr old vehicles	3	0	0	0	0
2	No. of 2 yr old vehicles	0	3	0	0	0
3	No. of 3 yr old vehicles	1	0	3	0	0
4	No. of 4 yr old vehicles	0	0	0	0	0
5	No. of 5 yr old vehicles	0	0	0	0	0
	TOTAL R4'S IN FLEET	4	3	3	0	0

VEHICLE FLEET REPAIR COSTS

	ALL VEHICLES:	1986	1987	1988	1989	1990
0	New vehicles	0	0	0	0	0
1	1 yr old vehicles	972,127	0	0	0	0
2	2 yr old vehicles	0	1,597,236	0	0	0
3	3 yr old vehicles	749,974	0	2,624,310	0	0
4	4 yr old vehicles	0	0	0	0	0
5	5 yr old vehicles					
	TOTAL REPAIR COSTS	0 1,722,102	1,597,236	2,624,310	0	0

FINAL SUMMARY OF RENAULT R4 COSTS	1986	1987	1988	1989	1990
Fuel	2,073,489	1,592,076	1,671,680	0	0
Repairs and Maintenance	2,014,102	1,833,756	2,879,752	0	0
Insurance and Registration	448,860	355,277	374,985	0	0
Purchase of Replacement Vehicles	0	0	0	0	0
TOTAL YEARLY OUTLAYS FOR ALL R4'S	4,536,451	3,781,109	4,926,417	0	0

EXHIBIT 12

(2 OF 10)

SINE SALOUM RURAL HEALTH DELIVERY SERVICES PROJECT

ESTIMATED VEHICLE OPERATING AND REPLACEMENT COSTS

ASSUMPTIONS FOR A NEW VEHICLE:	AVERAGE	1986	1987	1988	1989	1990
*** RENAULT TRAFFIC DIESEL ***		1	2	3	4	5
Vehicle replacement cost	5,702,950	5,702,950	6,159,186	6,651,921	7,184,075	7,759,901
General cost escalation factor	8.0%	100.0	108.0	116.6	126.0	136.0
Average vehicle life left in kms.	80,000	60,000	40,000	20,000	0	0
Average vehicle usage in kms/yr	20,000	20,000	20,000	20,000	20,000	20,000
Vehicle repair escalation index	100	100	164	270	444	729
Average repair cost in 1st yr.	100,000	100,000	164,303	269,955	443,545	728,759
Repairs as a % of original cost		1.8%	2.7%	4.1%	6.2%	9.4%
Repairs as a % of replacement cost		1.8%	2.7%	4.1%	6.2%	9.4%
Repair escalation factor ((1+r)3rd. r =	18.0%					
Average maintenance cost	109,000	109,000	117,720	127,138	137,309	148,293
Fuel cost per liter (CFA)	170					
Average vehicle fuel use km/lt	6.3					
Fuel cost per year	536,208	536,208	563,019	591,170	620,728	651,765
Insurance cost per year	352,637	352,637	370,269	388,782	408,221	428,632
Taxes & Registration per year	20,000	20,000	21,600	23,328	25,194	27,210
Fuel consumption escalation factor	5.0%					
Average vehicle life in yrs/mo	4.0					
Vehicle replacement sinking fund	1,939,700	1,939,700	1,939,700	1,939,700	1,939,700	0
Sinking fund cumulative balance		1,939,700	3,879,400	5,819,100	7,758,801	7,758,801

SUMMARY OF RENAULT TRAFFIC DIESEL OPERATING COSTS

Fuel	536,208	563,019	591,170	620,728	651,765
Repairs and Maintenance	209,000	282,023	397,093	580,854	877,053
Insurance and Registration	372,637	391,869	412,110	433,416	455,842
TOTAL YEARLY COSTS PER VEHICLE	1,117,845	1,236,911	1,400,373	1,634,998	1,984,659

VEHICLE FLEET INFORMATION

	ORIGINAL VEHICLES:	START:	1986	1987	1988	1989	1990
0	No. of new vehicles		0				
1	No. of 1 yr old vehicles	2	2	0			
2	No. of 2 yr old vehicles		0	2	0		
3	No. of 3 yr old vehicles		0	0	2	0	
4	No. of 4 yr old vehicles		0	0	0	0	0
5	No. of 5 yr old vehicles		0	0	0	0	0
TOTAL RENAULT TRAFFIC DIESELS		2	2	2	2	0	0
DESIRED NUMBER OF VEHICLES IN FLEET		2	2	2	2	2	2

EXHIBIT 12

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SINE SALOUM RURAL HEALTH DELIVERY SERVICES PROJECT

ESTIMATED VEHICLE OPERATING AND REPLACEMENT COSTS

Renault Traffic Diesel Page 2

	REPLACEMENT VEHICLES: START:	1986	1987	1988	1989	1990
0	No. of new vehicles	0	0	0	2	0
1	No. of 1 yr old vehicles	0	0	0	0	2
2	No. of 2 yr old vehicles	0	0	0	0	0
3	No. of 3 yr old vehicles	0	0	0	0	0
4	No. of 4 yr old vehicles	0	0	0	0	0
5	No. of 5 yr old vehicles	0	0	0	0	0
TOTAL REPLACEMENT VEHICLES	0	0	0	0	2	2
TOTAL VEHICLES IN FLEET	2	2	2	2	2	2
TOTAL COST OF REPLACEMENT VEHICLES		0	0	0	14,368,149	0

VEHICLE FLEET INFORMATION

	TOTAL VEHICLES:	1986	1987	1988	1989	1990
0	No. of new vehicles	0	0	0	2	0
1	No. of 1 yr old vehicles	2	0	0	0	2
2	No. of 2 yr old vehicles	0	2	0	0	0
3	No. of 3 yr old vehicles	0	0	2	0	0
4	No. of 4 yr old vehicles	0	0	0	0	0
5	No. of 5 yr old vehicles	0	0	0	0	0
TOTAL RENAULT TRAFFIC DIESELS IN FLEET		2	2	2	2	2

VEHICLE FLEET REPAIR COSTS

	ALL VEHICLES:	1986	1987	1988	1989	1990
0	New vehicles	0	0	0	251,942	0
1	1 yr old vehicles	304,265	0	0	0	413,949
2	2 yr old vehicles	0	499,917	0	0	0
3	3 yr old vehicles	0	0	821,380	0	0
4	4 yr old vehicles	0	0	0	0	0
5	5 yr old vehicles					
TOTAL REPAIR COSTS	0	304,265	499,917	821,380	251,942	413,949

FINAL SUMMARY OF RENAULT TRAFFIC DIESEL COSTS	1986	1987	1988	1989	1990
Fuel	1,126,038	1,182,339	1,241,456	1,072,417	1,126,038
Repairs and Maintenance	522,265	735,357	1,075,656	526,560	710,536
Insurance and Registration	745,274	783,738	824,221	866,831	911,695
Purchase of Replacement Vehicles	0	0	0	14,368,149	0

EXHIBIT 1.5

(1 OF 5)

SINE SALOUM RURAL HEALTH DELIVERY SERVICES PROJECT

ESTIMATED VEHICLE OPERATING AND REPLACEMENT COSTS

SUMMARY BY VEHICLE TYPE

ASSUMING GRADUAL PHASE-OUT OF NON-ESSENTIAL VEHICLES

(C.F.A)

FINAL SUMMARY OF PEUGEOT 505 COSTS	1986	1987	1988	1989	1990
Fuel					
Repairs and Maintenance					
Insurance and Registration					
Purchase of Replacement Vehicles					
TOTAL YEARLY OUTLAYS FOR ALL 505'S					

FINAL SUMMARY OF PEUGEOT 404 DIESEL COSTS	1986	1987	1988	1989	1990
Fuel	1,477,924	1,551,820	0	0	0
Repairs and Maintenance	1,702,660	2,620,732	0	0	0
Insurance and Registration	401,172	422,431	0	0	0
Purchase of Replacement Vehicles	0	0	0	0	0
TOTAL YEARLY OUTLAYS FOR ALL 404 DIESELS	3,581,756	4,594,983	0	0	0

FINAL SUMMARY OF PEUGEOT 404 COSTS	1986	1987	1988	1989	1990
Fuel	4,546,946	4,277,251	5,395,804	5,541,329	5,818,395
Repairs and Maintenance	2,548,422	2,009,496	2,374,360	2,909,057	4,300,925
Insurance and Registration	1,404,102	1,478,507	2,001,817	2,108,206	2,220,419
Purchase of Replacement Vehicles	0	11,523,600	12,445,488	3,360,282	0
TOTAL YEARLY OUTLAYS FOR ALL 404'S	8,499,469	19,288,834	22,217,469	13,918,874	12,339,739

EXHIBIT 15

(2 of 5)

SINE SALOUM RURAL HEALTH DELIVERY SERVICES PROJECT

ESTIMATED VEHICLE OPERATING AND REPLACEMENT COSTS

SUMMARY BY VEHICLE TYPE

ASSUMING GRADUAL PHASE-OUT OF NON-ESSENTIAL VEHICLES

(C.F.A)

FINAL SUMMARY OF RENAULT R12 COSTS	1986	1987	988	1989	1990
Fuel	3,973,381	3,424,437	2,648,047	1,230,125	1,291,631
Repairs and Maintenance	1,719,123	1,891,316	2,138,490	443,419	637,766
Insurance and Registration	904,008	794,007	669,558	352,918	372,075
Purchase of Replacement Vehicles	0	0	0	5,794,675	0
TOTAL YEARLY OUTLAYS FOR ALL R12'S	6,596,512	6,109,760	5,656,095	7,821,136	2,301,472

FINAL SUMMARY OF RENAULT R4 COSTS	1986	1987	1988	1989	1990
Fuel	2,073,489	1,592,076	1,671,680	0	0
Repairs and Maintenance	2,014,102	1,833,756	2,879,752	0	0
Insurance and Registration	448,860	355,277	374,985	0	0
Purchase of Replacement Vehicles	0	0	0	0	0
TOTAL YEARLY OUTLAYS FOR ALL R4'S	4,536,451	3,781,109	4,926,417	0	0

FINAL SUMMARY OF RENAULT TRAFFIC DIESEL COSTS	1986	1987	1988	1989	1990
Fuel	1,126,038	1,182,339	1,241,456	1,072,417	1,126,038
Repairs and Maintenance	522,263	735,357	1,075,656	526,560	710,536
Insurance and Registration	745,274	783,738	824,221	866,831	911,685
Purchase of Replacement Vehicles	0	0	0	14,368,149	0
TOTAL YEARLY OUTLAYS FOR ALL TRAFFIC DIESELS	2,393,577	2,701,435	3,141,332	16,833,957	2,748,258

EXHIBIT 15

(1 of 5)

THE GAMBIA RURAL HEALTH DELIVERY SERVICES PROJECT

ESTIMATED VEHICLE OPERATING AND REPLACEMENT COSTS

SUMMARY BY VEHICLE TYPE

ASSUMING GRADUAL PHASE-OUT OF NON-ESSENTIAL VEHICLES

(C.F.A)

FINAL SUMMARY OF PEUGEOT 505 COSTS	1986	1987	1988	1989	1990
Fuel					
Repairs and Maintenance					
Insurance and Registration					
Purchase of Replacement Vehicles					
TOTAL YEARLY OUTLAYS FOR ALL 505'S					

FINAL SUMMARY OF PEUGEOT 404 DIESEL COSTS	1986	1987	1988	1989	1990
Fuel	1,477,924	1,551,820	0	0	0
Repairs and Maintenance	1,702,660	2,620,732	0	0	0
Insurance and Registration	401,172	422,431	0	0	0
Purchase of Replacement Vehicles	0	0	0	0	0
TOTAL YEARLY OUTLAYS FOR ALL 404 DIESELS	3,581,756	4,594,983	0	0	0

FINAL SUMMARY OF PEUGEOT 404 COSTS	1986	1987	1988	1989	1990
Fuel	4,546,946	4,277,251	5,395,804	5,541,329	5,818,395
Repairs and Maintenance	2,548,422	2,009,496	2,374,360	2,909,057	4,300,925
Insurance and Registration	1,404,102	1,478,507	2,001,817	2,108,206	2,220,419
Purchase of Replacement Vehicles	0	11,523,600	12,445,488	5,360,282	?
TOTAL YEARLY OUTLAYS FOR ALL 404'S	8,499,469	19,288,834	22,217,469	13,918,874	12,339,739

EXHIBIT 15

(2 OF 3)

SINE SALOUM RURAL HEALTH DELIVERY SERVICES PROJECT

ESTIMATED VEHICLE OPERATING AND REPLACEMENT COSTS

SUMMARY BY VEHICLE TYPE

ASSUMING GRADUAL PHASE-OUT OF NON-ESSENTIAL VEHICLES

(C.F.A)

FINAL SUMMARY OF RENAULT R12 COSTS	1986	1987	1988	1989	1990
Fuel	3,973,381	3,424,437	2,848,047	1,230,125	1,291,631
Repairs and Maintenance	1,719,123	1,891,316	2,138,490	443,419	637,766
Insurance and Registration	904,008	794,007	669,558	352,918	372,075
Purchase of Replacement Vehicles	0	0	0	5,794,675	0
TOTAL YEARLY OUTLAYS FOR ALL R12'S	6,596,512	6,109,760	5,656,095	7,821,136	2,301,472

FINAL SUMMARY OF RENAULT R4 COSTS	1986	1987	1988	1989	1990
Fuel	2,073,489	1,592,076	1,671,680	0	0
Repairs and Maintenance	2,014,102	1,833,756	2,879,752	0	0
Insurance and Registration	448,860	355,277	374,985	0	0
Purchase of Replacement Vehicles	0	0	0	0	0
TOTAL YEARLY OUTLAYS FOR ALL R4'S	4,536,451	3,781,109	4,926,417	0	0

FINAL SUMMARY OF RENAULT TRAFFIC DIESEL COSTS	1986	1987	1988	1989	1990
Fuel	1,126,038	1,182,339	1,241,456	1,072,417	1,126,038
Repairs and Maintenance	522,263	735,357	1,075,656	526,560	710,536
Insurance and Registration	745,274	783,738	824,221	866,831	911,685
Purchase of Replacement Vehicles	0	0	0	14,368,149	0
TOTAL YEARLY OUTLAYS FOR ALL TRAFFIC DIESELS	2,393,577	2,701,435	3,141,332	16,833,957	2,748,258

EXHIBIT 15

(25 OF 25)

SINE SALOUM RURAL HEALTH DELIVERY SERVICES PROJECT

ESTIMATED VEHICLE OPERATING AND REPLACEMENT COSTS

SUMMARY BY VEHICLE TYPE

ASSUMING GRADUAL PHASE-OUT OF NON-ESSENTIAL VEHICLES

(C.F.A)

FINAL SUMMARY OF VEHICLE COSTS	1986	1987	1988	1989	1990
Fuel	13,197,777	12,027,904	11,156,987	7,943,870	8,276,064
Repairs and Maintenance	8,506,571	9,090,658	8,468,258	3,879,935	5,649,227
TOTAL VARIABLE OPERATING COSTS	21,704,348	21,118,562	19,625,245	11,722,906	13,885,291
Insurance and Registration	3,903,416	3,833,960	3,870,580	3,327,955	3,504,178
TOTAL YEARLY OPERATING COSTS	25,607,764	24,952,522	23,495,825	15,050,861	17,389,469
Purchase of Replacement Vehicles	0	11,523,600	12,445,488	23,523,106	0
TOTAL YEARLY OUTLAYS FOR ALL VEHICLES	25,607,764	36,476,122	35,941,313	38,573,967	17,389,469

EXHIBIT 14

(1 OF 1)

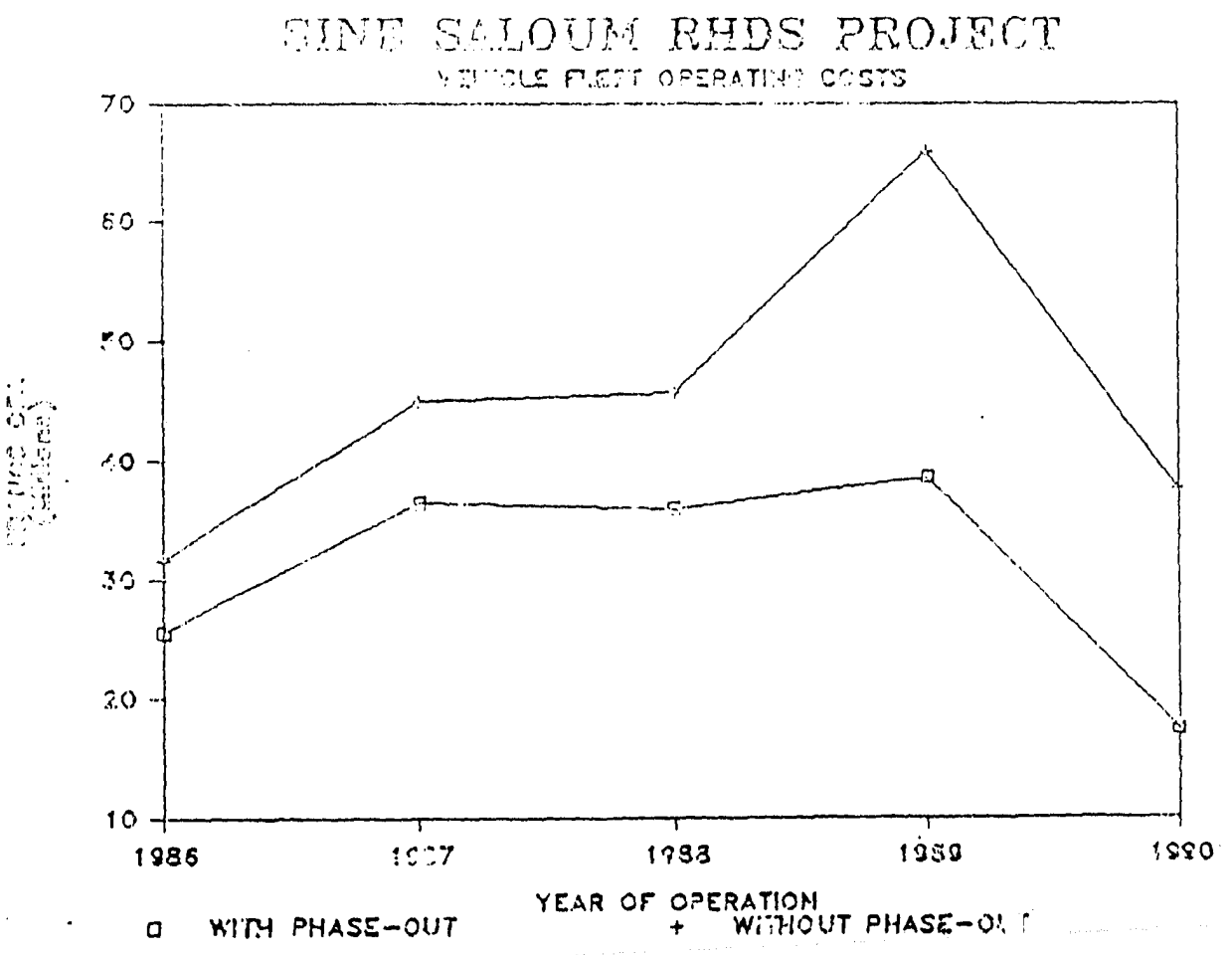
SINE SALOUM RHDS PROJECT

ESTIMATED SAVINGS TO BE REALIZED FROM VEHICLE FLEET PHASE-OUT

1986 - 1990

(000)

	COST UNDER NEW PLAN	COST UNDER OLD PLAN	AMOUNT SAVED	PERCENT SAVINGS
1986	25,602,764	31,650,748	6,047,984	19.1%
1987	36,474,172	45,076,420	8,602,248	19.1%
1988	29,941,313	45,309,838	9,368,525	21.5%
1989	38,573,967	65,927,013	27,353,046	41.5%
1990	17,389,469	37,475,038	20,085,569	53.6%



260

EXHIBIT 1?

(1 OF 2)

[illegible]

[illegible]

[illegible]

FUEL:

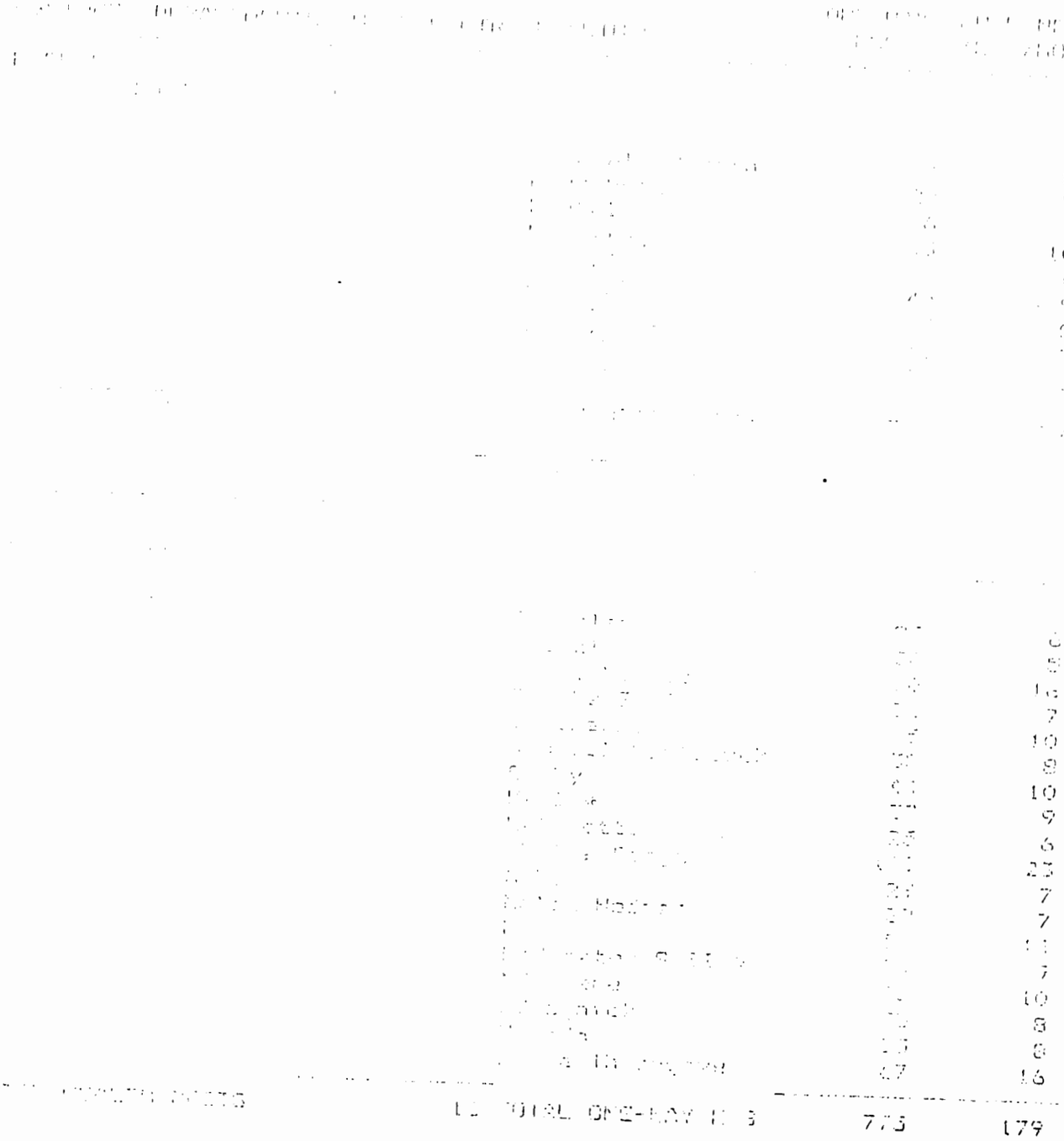
No. of visits to Health Pos[illegible] per yr [illegible] 12

Average automobile [illegible] fuel in [illegible] to [illegible] 3.[illegible]

Equivalent in [illegible] ..... [illegible]

Average cost of gasoline in [illegible] 250

	NO. OF HEALTH POSTS	NO. OF HEALTH HUTS	NO. OF HH PER HP
[illegible]	11	90	8.2
[illegible]	12	142	7.9
[illegible]	5	61	12.2
[illegible]	14	119	7.9
[illegible]	31	113	5.4
[illegible]	6	32	5.3
[illegible]	7	31	4.4
[illegible]	8	70	9.8
[illegible]	4	37	9.3
	[illegible]	[illegible]	7.4



TOTAL ONE-WAY [illegible]	773	179

[illegible] GALLONS OF FUEL USED PER YEAR

TOTAL COST OF [illegible] PER YEAR IN CPA $79,253

EXHIBIT 15

(3 of 4)

SENE-GAMBIA RURAL HEALTH DEVELOPMENT PROJECT

ESTIMATE OF FUEL REQUIRED TO SUPPLY HEALTH POSTS

REGIONS	DEPARTMENTS	HEALTH POSTS	ONE WAY KMS	FUEL USED (LITERS)
	Foundiougne	Dassilo Escale	20	14
		Four Escale	30	7
		Mata Yop	30	7
		Pinok	50	12
		Sely	15	3
TOTAL HEALTH POSTS		5 TOTAL ONE-WAY KMS	185	43

516 LITERS OF FUEL USED PER YEAR

TOTAL COST OF FUEL PER YEAR IN CFA 134,246

****

	Nioro	Nioro	Gaintes Kayes	24	6
			Kaymor	27	6
			Keur Maba	26	6
			Keur Madiabel	37	9
			Keur Moussa	17	4
			Medina Sabakh	28	7
			Missirah	25	6
			Ndrame Es.	59	14
			Ngayene	42	10
			Paoscoto	5	1
			Prokhane	8	2
			Sabova	42	10
			Taiba Niassene	12	3
			Wack-Ngouna	46	11
TOTAL HEALTH POSTS		14 TOTAL ONE-WAY KMS		398	95

1140 LITERS OF FUEL USED PER YEAR

TOTAL COST OF FUEL PER YEAR IN CFA 296,810

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EXHIBIT 15

(4 of 6)

[illegible]

[illegible]

REGIONS	DEPARTMENTS	HEALTH CTR	HEALTH POST	ONE WAY KMS	FUEL NEED (LITERS/MO)
Fatick	Fatick		Diakhao	30	7
			Diaoule	38	9
			Diarere	18	4
			Diofior	47	11
			Dioudoup	12	3
			Faoye *	31	7
			Fayil *	31	7
			Fimela	70	16
			Loul Sessene	40	9
			Marfafaco *	31	7
			Marlodji	78	18
			Mbellacadiao	16	4
			Ndiop	40	9
			Ngayokheme	38	9
			Niakhar	25	6
			Palamarin *	31	7
			Patar	38	9
			Samba Dia	79	18
			Tattaguine	25	6
			Thiare Ndialgui *	31	7
			Toucar	35	8
TOTAL HEALTH POSTS		21	TOTAL ONE-WAY KMS	784	181

2172 LITERS OF FUEL USED PER YEAR

TOTAL COST OF FUEL PER YEAR IN CFA 565,502

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REGIONS	DEPARTMENTS	HEALTH CTR	HEALTH POST	ONE WAY KMS	FUEL NEED
	Foundioungne	Foundioungne	Djilor	26	6
			Djirndah	Pirogue	0
			Bassoul	Pirogue	0
			Dionewar	Pirogue	0
			Niodior	Pirogue	0
			Passy	15	3
TOTAL HEALTH POSTS		6	TOTAL ONE-WAY KMS	41	9

108 LITERS OF FUEL USED PER YEAR

TOTAL COST OF FUEL PER YEAR IN CFA 28,119

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204

EXHIBIT 15

(5 of 6)

SINE SALOUM RURAL HEALTH DELIVERY SYSTEMS PROJECT

ESTIMATE OF FUEL REQUIRED TO SUPPLY HEALTH POSTS

REGIONS	DEPARTMENTS	HEALTH CTR	HEALTH POST	ONE WAY KMS	FUEL USED (LTS/MO)
		Sokone	Bakandy	40	9
			Coular Soce	32	7
			Keur Saloum Diane	20	5
			Keur Samba G.	49	11
			Missirah	30	7
			N. Dallassane Fall	13	3
			Toubacouta	18	4

TOTAL HEALTH POSTS 7 TOTAL ONE-WAY KMS 202 46

552 LITERS OF FUEL USED PER YEAR

TOTAL COST OF FUEL PER YEAR IN CFA 143,719

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Gossas		Gossas	Colobane	42	10
			Fass	24	6
			Mbar	30	7
			Ndiene Lagane	15	3
			Ouadiour	5	1
			Patar Lia	12	3
			Sadio	74	17
			Taif	54	13

TOTAL HEALTH POSTS 8 TOTAL ONE-WAY KMS 256 60

720 LITERS OF FUEL USED PER YEAR

TOTAL COST OF FUEL PER YEAR IN CFA 187,459

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		Guingineo	Gagnick	7	2
			Mbadakhoune	12	3
			Ndiago	7	2
			Ngathie	14	3

TOTAL HEALTH POSTS 4 TOTAL ONE-WAY KMS 40 10

120 LITERS OF FUEL USED PER YEAR

TOTAL COST OF FUEL PER YEAR IN CFA 31,243

****

8,400 94 2,187,024 3,01 700

265

EXHIBIT 15

(6 of 6)

SINE SALOUM RURAL HEALTH DELIVERY SERVICES PROJECT

SUMMARY OF ESTIMATED SUPERVISION FUEL COSTS

TOTAL NUMBER OF HEALTH POSTS SUPERVISED	94
TOTAL NUMBER OF KMS DRIVEN BY CAR	72,336
TOTAL NUMBER OF LITERS OF FUEL CONSUMED	8,400
TOTAL COST OF FUEL IN CFA FRANCS	2,187,024

C.M. NAME	KILOMETERS DRIVEN	LITERS OF FUEL USED	COST IN CFA
Kaolack	7,992	924	240,573
Kaffrine	18,600	2,148	559,253
Koungheul	4,440	516	134,346
Nioro	9,552	1,140	296,810
Fatick	18,816	2,172	565,502
Foundiougne	984	108	28,119
Sokone	4,848	552	143,719
Gossas	6,144	720	187,459
Guingineo	960	120	31,243
TOTAL	72,336	8,400	2,187,024

Please note that this model assumes that only one health post will be supervised per trip, implying a round trip from the CM to each of the health posts supervised. Additional economies may be realized by visiting several health posts at a time.

EXHIBIT 14

(1 of 1)

SINE SALOUM RURAL HEALTH DELIVERY SERVICES PROJECT

SUMMARY OF VEHICLE FUEL USAGE

JANUARY TO DECEMBER 1985

	LITERS		C.F.A.	
	GASOLINE	DIESEL	GASOLINE	DIESEL
FUEL PURCHASED BY USAID	95,000	25,000	25,254,150	4,281,950
TICKETS SENT TO PROJECT	47,500	10,750	12,350,000	1,826,250
ACTUAL FUEL USE BY VEHICLES				
Cars	32,080	13,540	8,340,800	2,300,355
Mobylettes	11,280	--	2,932,800	--
TOTAL VEHICLES	43,360	13,540	11,273,600	2,300,355

Average gasoline cost in CFA/liter 260

Average diesel cost in CFA/liter 170

EXHIBIT 17

(1 of 2)

*** PER DIEMS PAID AT THE VILLAGE LEVEL DURING 1985 ***

I. INITIAL TRAINING OF VILLAGE HEALTH WORKERS

MONTH DURING WHICH TRAINING TOOK PLACE	NUMBER TRAINED	NUMBER OF DAYS	DAILY PER DIEM	AMOUNT IN CFA
FEB	12	30	500	180,000
FEB	130	30	500	1,950,000
FEB	26	30	500	390,000
FEB	156	30	500	2,340,000
FEB	8	30	500	120,000
MAR	8	30	500	120,000
MAR	126	30	500	1,890,000
MAR	12	30	500	180,000
APR	16	30	500	240,000
APR	126	30	500	1,890,000
APR	129	30	500	1,935,000
APR	29	30	500	435,000
MAY	16	30	500	240,000
MAY	87	30	500	1,305,000
MAY	96	30	500	1,440,000
MAY	16	30	500	240,000
JUNE	13	30	500	195,000
JUNE	55	30	500	825,000
JULY	24	30	500	360,000
JULY	19	30	500	285,000
AUG	38	30	500	570,000
SEP	21	30	500	315,000
TOTAL TRAINING	1,163	660		17,445,000

II. RECYCLING (RETRAINING) OF VILLAGE HEALTH WORKERS

FEB	11	1	500	5,500
FEB	97	1	500	48,500
APR	65	1	500	32,500
JUNE	115	3	500	172,500
JULY	185	1	500	92,500
AUG	532	1	500	266,000
AUG	3	4	500	6,000
AUG	116	1	500	58,000
AUG	12	3	500	18,000
SEP	64	1	500	32,000
SEP	15	4	500	30,000
SEP	15	3	500	22,500
SEP	428	1	500	214,000
OCT	202	1	500	101,000
TOTAL VHW RECYCLING	1,860	26		1,099,000

EXHIBIT 17

(2 of 2)

*** PER DIEMS PAID AT THE VILLAGE LEVEL DURING 1985***

III. TRAINING OF VILLAGE HEALTH COMMITTEE MEMBERS

MONTH DURING WHICH TRAINING TOOK PLACE		NUMBER TRAINED	NUMBER OF DAYS	DAILY PER DIEM	AMOUNT IN CFA	
JUNE	*	50	2	1500	150,000	*
JULY	*	65	2	1500	195,000	*
JULY	*	10	2	1500	30,000	*
JULY	*	55	2	1500	165,000	*
JULY	*	45	2	1500	135,000	*
JULY	*	50	2	1500	150,000	*
OCT	*	5	2	1500	15,000	*
NOV	*	60	2	1500	180,000	*
DEC	*	60	2	1500	180,000	*
TOTAL VHC PER DIEMS		400	18		1,200,000	

SUMMARY OF PER DIEMS PAID AT VILLAGE LEVEL DURING 1985

	NUMBER TRAINED	AMOUNT IN CFA	PERCENT OF TOTAL PER DIEMS
TRAINING OF VHW's	1,163	17,445,000	88.4%
RECYCLING OF VHW's	1,860	1,099,000	5.6%
TRAINING OF VHC MEMBERS	400	1,200,000	6.1%
TOTAL VILLAGE PER DIEMS	3,423	19,744,000	100.0%

A N N E X V I I I

FINANCIAL ANALYSIS RECOMMENDATIONS

ANNEX VIII

FINANCIAL ANALYSIS RECOMMENDATIONS[1]

1. The Local Account

RECOMMENDATION #1 A study of the precise nature of all local account expenditures should be conducted in order to isolate expenditures that essential to the continuation of project activities in the future. As a result of the study, a more detailed chart of accounts needs to be implemented at the project office in Kaolack. The chart should enable the project accountant to readily identify all items of a controllable nature and inform management when actual expenditures begin to exceed the budgeted limits. Special attention should be focused on supplies, which made up 16.4% of total local account expenditures.

RECOMMENDATION #2 Once the 1986-87 budget has been officially accepted, the amounts should be distributed over the twelve months. The project accountant should show actual expenditures versus budget for each month and for the fiscal year-to-date. Any significant deviations from budget should be explained in writing.

RECOMMENDATION #3 The project should undergo a comprehensive audit in order to establish the accuracy of the financial statements and the propriety of expenditures. It should be possible to combine the audit with the study noted in Recommendation #1 above.

RECOMMENDATION #4 Given that the project has access to an IBM personal computer, the accounting system should be computerized using one of the better-known low-cost accounting packages, such as DAC-Easy or Ready-to-Run. Again, the audit team can assist in the selection and implementation of an adequate accounting package.

2. The Vehicle Fleet

Automobiles

RECOMMENDATION #5 The Peugeot 404 diesel fuel consumption figures should be verified during the forthcoming audit. If they prove to be accurate, the vehicles should be removed from service without delay.

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[1] Donovan Rudishole's recommendations are reproduced here because of the detail they include. They have been incorporated in shorter form in the Summary and Recommendations chapter.

RECOMMENDATION #6 The technical personnel from the Government of Senegal and USAID should conduct a review of all vehicle usage for supervision and personnel transportation to identify any activities that can be reduced or eliminated outright to reduce costs, which are above the level the GOS can sustain.

Mobylettes

RECOMMENDATION #7 The assistance of the Ministry of Decentralization should be requested in order to clarify the definition of investment goods. It should be argued that the mobylettes are fixed assets that are being used in a program to improve the health of the community and increase the productivity of agriculture.

3. Training Activities

Per Diems

RECOMMENDATION #8 The technical personnel from USAID and the Government of Senegal should perform a careful examination of the per diem question and attempt to establish whether or not the prospect of receiving 15,000 CFA is one of the prime motivating factors that attracts a villager to become a village health worker.

Training Center

RECOMMENDATION #9 USAID and Government of Senegal personnel should explore the possibility of operating the training center as a semiautonomous profit center. Given the fact that there is likely to be a considerable amount of excess capacity, it should be possible to offer the training facilities to organizations such as the World Bank or perhaps even other Ministries of the Government of Senegal. A standard daily fee could be charged for classroom rental and a separate daily charge for students housed in the center's dormitory. In addition, other services such as duplicating, photocopying and audiovisual equipment could be provided for a fee. The funds collected would serve to defray the training center's operating costs. The main obstacle to this approach is a legal one: there is no statutory provision that would permit the training center to collect fees for services from third parties. This issue needs to be taken up with Ministry of Finance.

4. Pharmaceutical Supply

RECOMMENDATION #10: USAID and the Government of Senegal should explore the possibility of establishing a revolving drug fund for the project area, at a minimum.* However, the maximum benefits of this sort of a system would be obtained if it were implemented on a national level. The main obstacle to this approach is the resistance to the idea of charging a markup on drugs distributed to the health institutions in the country. However, it may be possible to demonstrate that with a more efficient centralized procurement mechanism and better inventory planning and management, the actual cost to the public may in fact decline, even with the revolving drug fund markup included. A study should be undertaken with the goal of evaluating the current performance of the procurement system with respect to price, continuity of supply, and quality of products purchased. The study should also take into account the production capabilities of SIPOH, the national drug manufacturing organization.

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* How would this differ from what exists? Although the Project has established a type of revolving drug fund in the regions of Fatick and Kaolack, recycling of funds for additional purchase of drugs is to occurring; in addition, there is concern that when the new hospital comes on line, there will be a great demand for the types of products the project is stocking. Given the fragility of the current system, the hospital needs could clean out project dispensaries. The recommendation made here is that the continuity in the availability of drugs will depend on a tightening up of the system so that through procurement of large quantities of drugs from a centralized source, through good inventory planning, and recycling of funds, the consumer should be able to purchase drugs at any time at an affordable price.